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STUDIES OF PHONETIC TRAINING IN BEGINNING READING

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In the *Teachers College Record* of March, 1925, were published certain facts concerning the present use of phonetic methods in the teaching of first year reading in twenty-one of the most widely used published systems. These data indicate that phonetic training is one of the major concerns of the authors of primary reading courses and, as a consequence, the development of phonetic skill probably becomes a major concern of primary teachers. No other single teaching device has been so widely adopted by American teachers. It is the very keystone of the American method. For a practice given so much and such universal attention over so long a period of time one would expect to find ample justification. Favorable evidence may be sought in four different sources:

1. In the data concerning the phonetic characteristics of the English language.
2. In the results of experimental investigations of the use of phonetic methods with school children.
3. In the logical application of principles of the psychology of learning to the use of phonetics as a teaching device.
4. In the opinions of recognized students of pyschology and education who are familiar with the scientific literature concerning the teaching of reading or who have observed extensively the results of various methods utilized in schools.

Brief Account of Present Evidence Concerning Phonetic Training

In none of the sources is the evidence unequivocal. The fact that the English language is approximately 85 per cent phonetic means

merely that in most cases the word-form and sound relations have certain precedents. The difficulty is that the majority of words have too many precedents. For example, *cat* which is phonetic because it is "pronounced as it is spelled" in accordance with certain customs of usage, may be pronounced as *Kate, cot, ket, sat, set,* or *sate* by following different customary translations of the letters into sound. It is possible that English phonetic translations are too varied and complex to be readily mastered by Grade I children.

Because of limitations in the experimental technique, the experimental studies of phonetic methods are few and none is conclusive. For the most part they have consisted of comparisons of phonetic training with a "look and say" procedure. The results, as the writer interprets them, indicate deficiencies in both systems. The "look and say" methods produce rapid and comprehensive reading but defective techniques of dealing with unfamiliar words, whereas the phonetic training which usually yields good word-naming often results in slow and mechanical reading with insufficient grasp of the thought. Neither system seems satisfactorily to develop with economy of effort all of the important reading skills.

Appraised from the point of view of established principles in psychology, the phonetic method cannot fully escape criticism. It smacks of the method of the supplementary device. It is a close kin of such formal exercises as separate drills on ovals, loops, and other figures in writing; of calesthenics in physical training, of elaborate finger and vocal exercises in musical training. In the light of the theory which considers all learning to be the establishment of definite reactions to specific situations and in the light of established facts concerning the transfer of training, the validity of phonetic and other supplementary devices may well be questioned. Their probable weakness lies precisely in the fact that they are supplementary and not intrinsic. They depend upon the transfer of training which probably occurs in small degree, if at all.

The phonetic system is usually accepted by the more active students of the psychology of reading, although reservations and uncertainties are commonly expressed. The National Committee on Reading which rendered its report in the *Twenty-fourth Yearbook of the National Society for the Study of Education* in 1925, proposed the adoption of phonetic training "pending the settlement of controversial points by scientific investigations." This careful report outlined what

is probably the best of available methods of phonetic instruction and stated the results it should achieve. They are as follows:

(*a*) "Knowledge of a number of phonetic elements."

(*b*) The "use of these elements in actual reading situations."

(*c*) "Accurate pronunciation and enunciation as well as ready recognition."

(*d*) "The habit of seeing a word as a unit made up of known parts."

(*e*) "The habit of attacking an unknown word and working it out independently."

Plans of Experimental Studies of Phonetic Methods

When experimental studies previously made are inconclusive, when the opinions of specialists in reading are in the main favorable but the implications of principles of the psychology of learning probably antagonistic to the teaching of phonetics by typical methods, and when vast amounts of time and effort are expended on this phase of training in American schools, further experimentation is clearly in order. During the past several years the writer has attempted to carry on certain investigations in the subject. The present report gives merely a brief statement of results thus far obtained. Adequately to measure the main possible outcomes of phonetic work requires extensive examinations. The detailed results were so voluminous as to require a larger report.[1]

In designing the studies thus far undertaken, it was decided to attempt to compare with phonetic methods not mere unguided, "natural," or "look and say" learning of reading since the inadequacies of this type of learning are strongly suggested if not fully demonstrated in various earlier investigations. Instead, improvised forms of what may be called "intrinsic" methods have been utilized for comparison with phonetic training. Since little if any materials of the sort thought to be suitable for this purpose were available and since there are but few suggestions in the literature concerning suitable procedures of this sort, the types of study and materials first prepared can scarcely be the best possible. The first forms of material used were developed from suggestions afforded by certain studies of individual cases some of which have been published.[2] As the result of trial of each set of material, improvements have been sought for further studies.

[1] In a volume entitled "Phonetic and Intrinsic Methods in Reading," to be published by the Bureau of Publications, Teachers College.

[2] "In Psychology of Reading and Spelling with Special Reference to Disability." Teachers College Bureau of Publications, 1922.

For phonetic training, materials and methods have been searched for which as far as possible would satisfy the recommendations made in the report of the National Committee referred to above. Although certain phases of their recommendations were a little vague, the methods adopted did, in the opinions of intelligent teachers, meet the requirements of the Committees' recommendations.

Two experiments have been performed. The first, using two groups in the Horace Mann School, comprised practice periods of from 15 to 30 minutes daily from November 10, 1923 to May 10, 1924. The second, utilizing four groups in a New York Public School, ran from October 15, 1925 to April 15, 1926. In both studies, the equivalent group technique was employed. The groups were made equivalent in age, Mental Age, Intelligence Quotient, and abilities shown in several tests of word recognition, word perception, knowledge of the alphabet and reading.

The Phonetic and Non-phonetic Methods Studied

The phonetic methods will not be here described since they may be considered as representing the superior types in which phonetic analysis and blending are related as closely as possible to real reading situations. The methods are given in detail in the volume now in press.

The materials used with the non-phonetic group were of two sorts, a number of exercises arranged wholly to stimulate reading to secure the thought and a number arranged not only to emphasize comprehension but also to demand accurate discrimination of words and phrases in order correctly to indicate or express the thought. In other words, only part of the periods was spent in training especially emphasizing word perception. Most of the materials used in the first study were comprehension exercises arranged to accompany two primers, the Bolenius and the Elson. The main types of materials were as follows:

1. *True-False Statements.*—First, the pupil read a story in one of the Primers. Then he was given a sheet containing such statements as the following:

Dolly Dot has milk to drink.
Dolly Dot has no milk to drink.

The pupil marked the right statement. In some instances the statements were printed on cardboard slips which were sorted into two

piles, true and false. A relatively small number of the statements were arranged to require sharp discrimination of similar words and to assist pupils to perceive similarities and differences among words. A sample of such an exercise follows, in which the words *cat* and *cow* are arranged for comparison:

"Moo, moo," said the cat.
"Moo, moo," said the cow.

2. *Completion Exercises.*—Most of the completion exercises were questions or statements concerning the context of passages read in the Primers. They were printed on light paper board. The following are examples.

1. Who were in the playhouse.
2. "I will call Tom and Betty," said
3. Tom and Betty found in the play
4. The said: "Cock-a-doodle-do."
5. The said: "Gobble, gobble, gobble."

A number of card slips with correct and incorrect words were provided to complete the sentences. Often in the list were included a few words with elements in common with the correct words in order to stimulate perceptive accuracy. For example: *has* and *was; sing* and *ring; went* and *west; hat* and *has; hat* and *that*, etc.

3. *Yes-No Exercises.*—These were mimeographed on paper with primer type in the following form:

1. Has Dolly Dot a play house?	Yes	No	:	No
2. Did Turkey Lurkey say, "I will tell Tom and Betty?"	Yes	No	:	Yes
3. Did Teddy Bear say, "I will tell Dolly Dot?"	Yes	No	:	No

The slip of paper to the right of the dotted line, which contained the correct answer, was folded under while the pupils were doing the exercises and was later used to check their responses. When their solutions were wrong, the pupils were expected to reread the sections of the story which gave the facts. In this type of material, special devices for emphasizing word elements were rarely introduced. The teacher reported this type of material to be highly interesting and applicable to all of the pupils.

4. *Selection Exercises.*—These took many forms; a few are illustrated:

	will told	
1. Who will well Dolly Dot to come?		will tell
	will tell	
"I who"		
2. "I will," said Rooster Pooster.		I will
"I well,"		
	She came.	
3. What did Dolly Dot do?	She sang.	She came.
	She rang.	

These exercises were based on contexts previously read; they contained a self-corrective device and were usually arranged to sharpen perception as indicated. They were also greatly enjoyed and readily used by the pupils.

In the second experiment, instead of using exercises based upon Primers and other materials not designed for such use and resulting necessarily in a good deal of cumbersomeness and crudity, the stories, poems, informative selections, seat work, exercises and vocabulary training were originated for the purpose. The main characteristics of the materials were as follows:

1. All the work required intelligent comprehension of printed material. There were no exercises extrinsic or "supplementary" to comprehension; no work on printed material purely for the purposes of drill in the mechanics of the reading process in which comprehension was not engaged.

2. No phonetic drill of any kind was included.

3. No devices such as methods of dividing words into syllables, breaking a word into parts, etc., were taught either in the material or at other times by the teacher using the material.

4. The devices used to stimulate sharp perception of words, to disclose similarities and differences, to emphasize common elements and to encourage the use of context clues in perceiving unfamiliar words were similar in essence to those used in the first study although often different in the concomitant activities utilized. Directions to be executed and comprehension questions to be answered were the two main types of activities.

Results of the Studies

In both studies, extensive tests of results were made at about the middle and at the close of the practice period. Since the outcomes were substantially the same in both tests and for all groups, we shall present in this brief report only the quantitative results for two groups

in the second study together with statements of the general results. Table I gives the quantitative results.

TABLE I.—SHOWING THE RESULTS OF 16 FINAL TESTS FOR THE TWO GROUPS

	Phonetic Group B average	Non-phonetic Group C average	Difference in favor of non-phonetic	$PE_{diff.}$
1. Gates Reading of Paragraphs.....	10.4	14.6	4.2	0.8
2. Haggerty Part 1, Paragraphs.....	6.5	8.7	2.2	0.7
3. Haggerty Part 2, Sentences.....	4.0	5.8	1.8	0.5
4. Gray's Oral Paragraphs.....	4.1	4.7	0.6	0.6
5. Pronunciation; new words; all types..	33.1	33.5	0.4	0.9
6. Pronunciation; new combinations of familiar word units.....	20.0	22.1	2.1	1.0
7. Pronunciation; word families.....	22.0	23.8	1.8	0.9
8. Pronunciation of compound words....	9.3	10.4	1.1	0.6
9. Naming letters of alphabet.....	51.3	51.8	0.5	
10. Sounding letters.....	19.4	20.0	0.6	
11. Reading phonograms; co, st, un, etc...	22.2	20.5	−1.7	0.7
12. Reading phonograms; ade, ing, etc....	5.6	7.2	1.6	0.5
13. Reading combined phonograms, plim, umpo, etc.....	2.8	2.4	−0.4	0.4
14. Giving letter equivalent to sounds....	7.6	7.6	0.0	
15. Giving letter equivalent of phonograms	4.7	4.8	0.1	
16. Word perception test.....	20.2	25.2	5.0	1.3

In the summaries of results, the quotations refer to the expected outcomes of phonetic training as given in the report of the National Committee. The discussion considers the degree to which the two types of training satisfied these requirements.

1. "Knowledge of a number of phonetic elements." The tests, numbered 9, 10, 11, 12, 13, 14 and 15 in Table I were designed to measure knowledge of phonetic elements. Table I indicates the probability that only in the recognition of isolated two-letter phonograms such as *co, st, un,* etc. did the phonetic training exceed the non-phonetic. In naming and sounding letters, in pronouncing the longer phonograms such as *ade, ing,* etc., and in giving the letters which represent sounds of letters or syllables, the non-phonetic training was as effective as the phonetic. In pronouncing combinations of phonograms such as *plin, unpo,* etc., the phonetic group probably excelled only to a degree that

may be explained as the result of their superior mastery of the component two-letter phonograms.

The non-phonetic group, it will be recalled, received no training in phonetic translation. The fact that the extensive phonetic work of the other group produced so slight an advantage may be considered as a moral victory for the non-phonetic methods.

2. "Ready recognition" of words is one of the objectives of phonetic training according to the report in the *Yearbook*. In both experiments, the tests of speed and accuracy of words variously arranged in test situations showed slightly superior results for the non-phonetic training. (The quantitative results appear in Table I, Tests 5, 6, 7 and 8.) In the first series of tests in the second study the non-phonetic group showed some superiority in the recognition of the words which had been previously studied. In all other tests which depended on recognition in some form the non-phonetic group was at least the equal of the phonetic group.

3. "Accurate pronunciation." The data available on this skill were taken from the results of the Gray's Oral Reading Tests, the Gates Word Pronunciation and the several other tests of reading isolated words, in all of which mispronunciations were recorded. In these data, no differences on the whole, between the phonetic and non-phonetic pupils were found.

4. "The habit of seeing a word as a unit of known parts." How pupils *see* words we can only surmise from their success and errors in getting the meanings of words or in pronouncing them. In observing the work of the pupils, evidence was found in support of the belief that, even when about equally competent, pupils trained by the two different methods perceive words in different ways. The non-phonetic training seemed to sharpen perception especially for characteristics of the total configuration, for large word units (including whole component words, syllables and the larger phonograms) and also for unique characteristics of words more than the phonetic which seems to center attention on the smaller details of words especially the two letter phonetic elements. Apart from differences in these *objects* of word perception, the two types of training seem to produce differences in the modes of observation. The non-phonetic pupils tended toward a rapid appraisal of the word whereas the phonetic pupils tended toward a slower, more detailed study. The former pupils were more likely to give the word a general survey and quickly produce a trial recognition and pronunciation; if this were wrong they would try again, often varying the type of observation and usually restoring to more detailed study

if the other methods failed. The phonetic pupils were, on the whole, more likely to labor longer with the details before attempting the word as a whole. Which of these procedures is better should be judged primarily on the basis of practical success in reading recognition.

5. "The use of these elements in actual reading situations" and "the habit of attacking unknown words and working them out independently" are the tests of practical success of phonetic training suggested in the "Yearbook" and elsewhere. Tests of these main objectives were provided in three forms: (1) Tests of ability to recognize and pronounce various types of isolated words, such as words made up of familiar phonetic elements (Tests 6 and 7), words compounded from smaller words which the pupils had studied (Test 8) and lists of new words of various types and lengths (Test 5); (2) Tests of ability to read orally senseful passages of different degrees of difficulty (Test 4) and (3) various tests of comprehension in silent reading in which correct recognition was necessary (Tests 1, 2 and 3).

The results of both studies show slight differences between the two groups in gross achievement in the recognition and in the pronunciation of isolated words although differences in methods of attack were apparent. Both groups showed ability to recognize elements in new words and both showed a degree of independent ability to work out the recognition of unfamiliar word forms. The nature of the differences between them have been sufficiently suggested under (1) and (4) above. In tests of rate and accuracy of pronunciation in oral reading, the two groups were about equally competent in general, although the non-phonetic pupils in the second experiment had had less oral-reading experience than the phonetic and probably less than was advisable. In this work the non-phonetic pupils usually showed a greater disposition to depend on the context and to attack the larger word units or features of configuration; the phonetic groups resorted more to detailed analysis of the new words encountered.

In general efficiency in silent reading comprehension, the non-phonetic pupils demonstrate markedly superior attainments. If this type of ability is admitted to be the main objective of reading instruction, the non-phonetic training showed a clear advantage. In the second and longer study, the non-phonetic pupils were superior in silent reading by 35 per cent; in the first study their advantage was also marked.

Implications of the Results of the Studies

Is Phonetic Training Advisable?—If it were necessary to choose between the two forms of training studied, the non-phonetic training

would be selected. In some of the earlier investigations—as suggested by such titles as "Phonics or No Phonics"—it has appeared that there was no choice other than to accept or reject the complete phonetic system. The intelligent procedure is to determine what phonetic devices, drills or instructions, if any, are of value, and how and when to use them. The present study has not accomplished these purposes fully except to indicate certain attitudes and skills which phonetic training produces that seem to be of value, others that seem to be useless or harmful, as well as to point to a large amount of work which appears to be unnecessary. That it will be the part of wisdom to curtail the phonetic instructions in the first grade very greatly, is strongly implied; indeed, it is not improbable that it should be eliminated entirely. Certain forms of training commonly found in the system may possibly earn a place, however, though probably not without some modification, in an improved program of training in beginning reading. Other studies are under way or planned to test the usefulness of some of the particular phonetic procedures.

Limitations of the Non-phonetic Training.—Many of the limitations of the non-phonetic devices used in these studies such as those due to crude mimeographing, to too easy or hard materials and the like are not intrinsic in the method. Certain other limitations of the training made during these experiments were known and deliberately introduced in order to make possible a better appraisal of a limited type of training. For example, the writer believes that direct instruction in the knack of dividing words into syllables[1] by certain devices and explanations is, in general, a very helpful addition to non-phonetic training, yet this form of instruction was not introduced for the reason that its effects would obscure the results brought about by the use of the material alone. That the non-phonetic materials and methods here used are alone either perfect or sufficient is not claimed. It is only maintained that, in comparison with phonetic training, the non-phonetic possesses more merits, and indicates a more promising line of future development.

Implications Concerning General Theories of Learning.—These studies suggest, in particular, the advantages of an intrinsic method of learning in comparison with the method of the supplementary device. They add anew to a constantly growing body of objective evidence in support of this theory.

[1] This point has been discussed in the writer's "Psychology of Reading and Spelling with Special Reference to Disability," and in the "Manual of Directions for the Gates Primary Reading Tests." Teachers College, Bureau of Publications.

DIFFERENTIATION OF CERTIFIED PUBLIC ACCOUNTANTS FROM OTHER OCCUPATIONAL GROUPS

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Men engaged in the same occupation have similar interests which tend to be unlike those of men in other occupations. This is apparent from the results presented here and elsewhere.[1]

The data have been secured from an Interest Analysis Blank, adapted by K. M. Cowdery from one used by Max Freyd. The subject indicates after each of the 263 items his attitude toward it—whether of liking, indifference or dislike.

From these data a method of measuring a man's professional interest was developed as follows. First, the percentage of all the men in the eighteen occupations tested who like, are indifferent to, or dislike each of the 263 items was obtained. (Thus, 16 per cent like bookkeeping, 27 per cent are indifferent about it, and 57 per cent dislike it.) Second, the per cent of members of any profession, as that of certified public accounting who like, are indifferent to, or dislike each of these items was obtained. (Thus, 42 per cent of certified public accountants like bookkeeping, 36 per cent are indifferent to it and 22 per cent dislike it.) Third, the differences for each item between men in general (using the data from the eighteen occupations for this purpose) and certified public accountants were obtained, *i.e.*, +26 per cent, +9 per cent and −35 per cent, respectively, in the case of the item bookkeeping. Fourth, these differences were expressed by smaller figures (*i.e.*, +6, +2, −8) according to a statistical system outlined in the September 1926 article of the *Journal of Personnel Research*. These figures constitute the scoring system for measuring the extent to which anyone has the likes and dislikes characteristic of certified public accountants.

If a man records that he likes being a bookkeeper he receives a +6 toward being a certified public accountant; if he records that he dislikes being a bookkeeper he receives a score of −8 toward

[1] Cowdery, K. M.: Measurement of Professional Attitudes. *Journal of Personnel Research*, August, 1926.

Strong, E. K., Jr.: An Interest Test for Personnel Managers. *Ibid.*, September, 1926; Interest Analysis of Personnel Managers. October, 1926.

being a certified public accountant. The summary of 263 such scores gives his final score as compared with average certified public accountant interests.

The scoring for this item of bookkeeping for the eighteen occupations is given in Table I.

TABLE I.—SCORES FOR 18 OCCUPATIONS AS BASED ON THE ITEM "BOOKKEEPING"

	Like	Indifferent	Dislike
Author	−5	0	3
Advertising agency "account executive"	−6	−4	8
Artist	−5	2	5
Banker	8	−1	−7
Certified public accountant	6	2	−8
Doctor	−1	−1	2
Engineer	−2	−1	4
Executive	0	0	0
Lawyer	−4	−2	5
Minister	0	2	−1
Office worker	1	2	−3
Personnel manager	−1	−3	4
School teacher and administrator (male)	1	2	−3
Department store salesman	0	5	−5
Fuller brush salesman	0	3	−3
Life insurance salesman	0	−1	1
Retail store salesman	1	2	−4
Service station employee	0	−2	2

What is measured is the degree of similarity or dissimilarity between one man's interests and those of the average member of a given occupational group, weight being given in the case of each of the 263 items in terms of the difference between the group average and a general average. The assumption here is that the gross strength of any interest is not significant in vocational selection. The important factor is whether or not a man has an interest which distinguishes the occupation in question from other occupations. For example in the case of the item bookkeeping, bankers, certified public accountants and office workers like the item more than men in general. If any individual indicates such a liking he is scored for these three occupations proportionately to the extent that men in the three occupations like it more than the average man.

If the more usual method of correlating the interests of a particular group of men with the average interests of several different groups is employed, it is impossible to separate these men according to their occupations with any marked degree of success. At least, this is the result from such a statistical handling of part of our data. But when the method already outlined is employed occupational groups are separated in most cases to a surprising degree, as shown in Figs. 2 and 3. Emphasis is to be put upon the method used here. It does not measure the degree a man's interests approximate those of a particular group. It discovers whether or not his interests coincide with those interests which distinguish the occupational group from other groups.

From the records of 99 certified public accountants it is known that they obtain total scores ranging between 171 and −11 when measured for certified public accountant interest. The man who obtained the −11 score reports he does not like his occupation and the test confirms the fact. The next lowest score is +39. This latter figure is used as the lower critical score.

All of the data have been expressed, not in raw scores, but in terms of the PE of the distribution of the occupational group in question. In the case of certified public accountants this gives a range of +3.0 to −3.0 (excluding the individual who scored −11; his converted score being −5.3 PE). (Median is 105 and Q is 22.)

Scores above −1 PE are rated A, scores between −1 PE and the lower critical score (the lowest score in nearly every case) rated B. Scores below the critical score are rated C. By definition then, three-fourths of men belonging to a given occupational group are rated A in their own group and one-fourth are rated B. Only four or five from among the 1271 men composing our criterion groups, received a rating of C in their own occupational interest, as in the case of the man scoring −5.3 PE.

Apparently if a man rates A he has enough of whatever it is that is tested by the Interest Blank to make good in the given profession. His degree of success will depend upon factors other than those measured here. In the case of B ratings it appears that some men are just as successful as those who rate A, but some are not so successful. The three ratings, A, B, and C, express approximately "Yes, you belong to the group," "Am not sure," and "No, you do not belong."

One substantiation of this is in order. Records were recently received from 42 members of an advertising agency. When these men

were scored in terms of our criterion group for advertising agency "account executive" interest it was found that 17 rated A, 16 B, and 3 C. All 36 were rated as to their "account executive" standing by three members of the advertising agency, using 2 to mean "Yes," 1 to mean "Not sure," and 0 to mean "No." The results were

Rated A by interest test——rated on average 1.69 by 3 judges
Rated B by interest test——rated on average 1.26 by 3 judges
Rated C by interest test——rated on average 0.43 by 3 judges

Only 3 of the 17 men rated A by the test were judged as low as 1.0 by the 3 judges, whereas all the men rated C by the test were judged 0.7 or 0.3. Expressed in still another way we have:

Rated 2.0 by 3 judges 73 per cent rated A on test; 27 per cent, B; 0 per cent, C.
Rated 1.7 by 3 judges 71 per cent rated A on test; 29 per cent, B; 0 per cent, C.
Rated 1.3 by 3 judges 50 per cent rated A on test; 50 per cent, B; 0 per cent, C.
Rated 1.0 by 3 judges 27 per cent rated A on test; 73 per cent, B; 0 per cent, C.
Rated 0.7 by 3 judges 0 per cent rated A on test; 67 per cent, B; 33 per cent, C.
Rated 0.3 by 3 judges 0 per cent rated A on test; 0 per cent, B; 100 per cent, C.

Extent to Which Certified Public Accountants Can Be Differentiated from Non-certified Public Accountants on Basis of Interests

The data in this section are based on the records of 99 certified public accountants as contrasted with the records of 598 men, composed as follows: 51 bankers, 44 office workers, 40 lawyers, 42 engineers, 48 personnel managers, 50 authors, 65 school teachers, 51 life insurance salesmen, 48 advertising agency men, 53 doctors, 50 ministers and 56 artists. The records of the 99 certified public accountants, about 50 per cent of those registered in the state of California, were secured by Mr. William Dolge formerly secretary of the California State Board of Accountancy. The high percentage of returns is undoubtedly due to the interest he took in the matter.

The distribution of scores of the 99 certified public accountants is presented in the first chart of Fig. 2. The distribution of 598 men who are not certified public accountants is given in Fig. 1. Only 20.5 per cent of the latter fall within the distribution of the certified public accountants—0.3 within the first quarter, 0.5 per cent in the second quarter, and 2.7 per cent in the third quarter and 17.0 per cent in the fourth quarter. In other words, 3.5 per cent of these 598 men are rated A, and 17.0 per cent are rated B for certified public accountant

interest. (The first vertical line at the left dividing those rated B from those rated C is jogged so as to include within the B group those whose score is −3.0 and to exclude those whose rating is less than −3.0.)

A test that will separate an occupational group from other occupational groups as clearly as outlined here is of real significance. It is believed that a revised blank will separate occupational groups still more definitely. All the evidence, however, that has been accumulated indicates that a certain amount of over-lapping is to be expected. Some men do have interests in common with more than one occupation.

A study of the thirteen distributions in Fig. 2 shows that the above figures do not represent all occupational groups equally well.

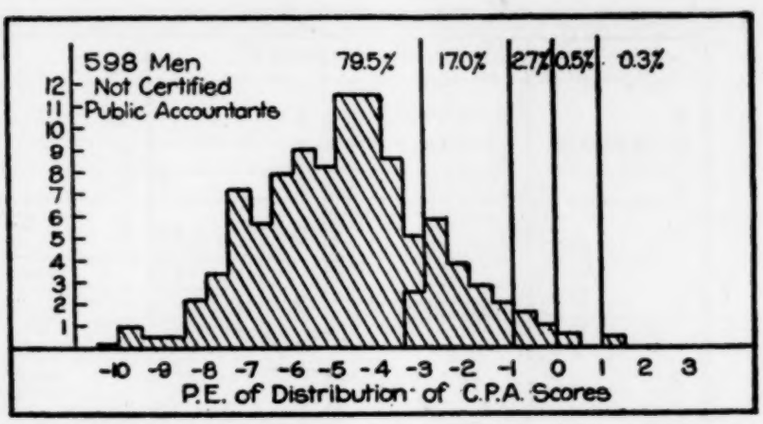

FIG. 1.—Distribution of scores of men who are not certified public accountants on interest test for certified public accountant interest.

Instead of only 3.5 per cent rating A, we find 20 per cent of bankers rating A, 6 per cent of personnel managers, 5 per cent of lawyers and 4 per cent of life insurance salesmen; while at the other extreme we find 0 per cent of advertising men, doctors, ministers and artists rating A in certified public accountant interest. A larger percentage of bankers, office workers, lawyers and engineers rate B than the average while only 10 per cent of advertising men rate B, 8 per cent of doctors, and 0 per cent of ministers and artists.

Not only is it unusual to have a test separate two groups completely as it does in the case of ministers and artists but it is also unusual to obtain scores between −5 and −10 PE. Yet in this case 45.7 per cent of the 598 men score −5 PE or lower an 1.7 per cent score −9.0 PE or lower.

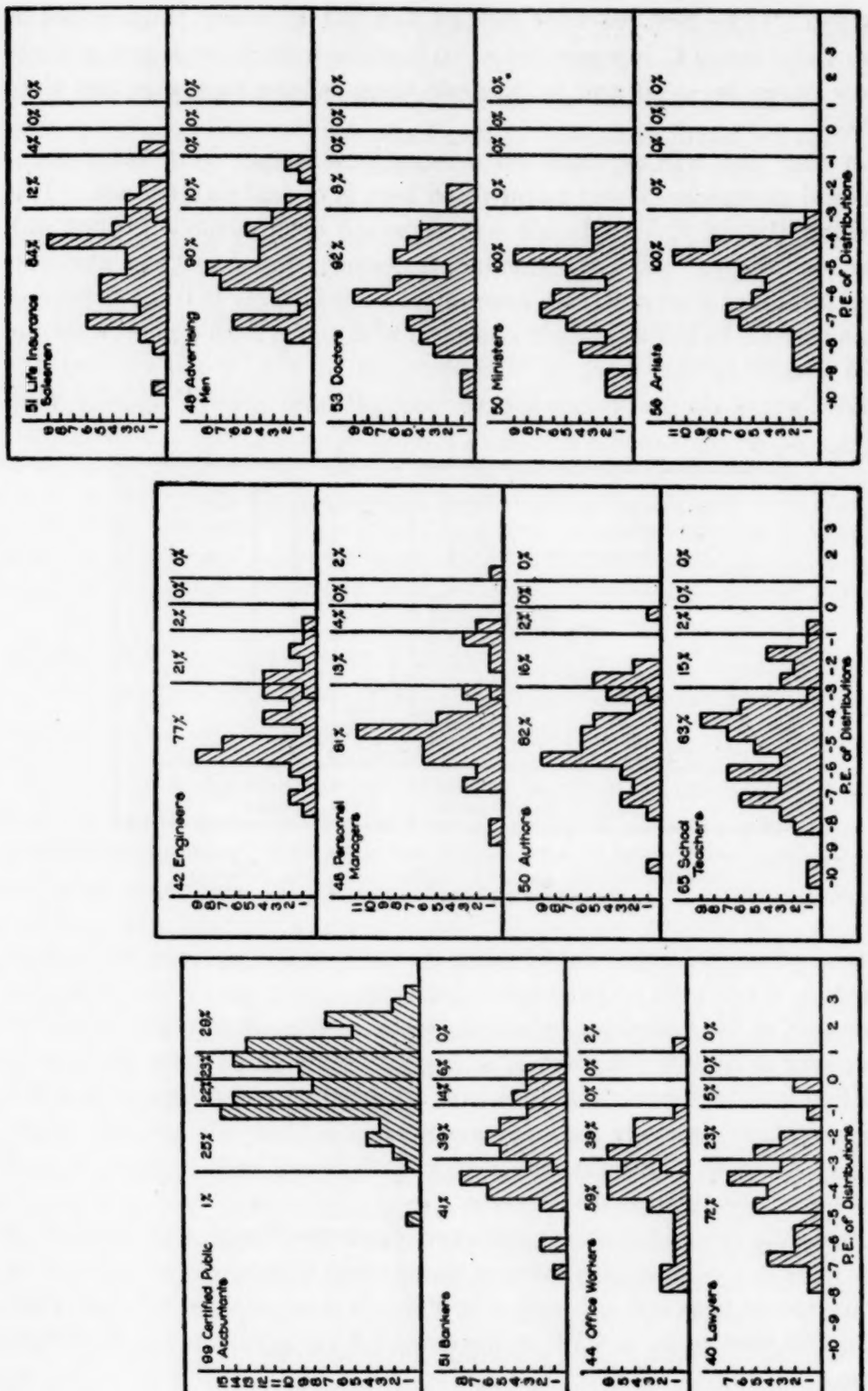

FIG. 2.—Distributions of scores of 697 men from thirteen occupations for certified public accountant interest.

FIG. 2.—Distributions of scores of 697 men from thirteen occupations for certified public accountant interest.

EXTENT TO WHICH MEN RATE LIKE ENGINEERS, PERSONNEL MANAGERS AND CERTIFIED PUBLIC ACCOUNTANTS

In Table II are presented the per cent of men in various occupations who rate A and B in interest of certified public accountants, engineers and personnel managers. It is not easy to draw conclusions from these figures. On the whole, those occupations that are largely concerned with human beings overlap in interest with the occupation of personnel manager but, with the exception of lawyers, these are occupations that overlap very little with certified public accountants. It was a surprise to the writer that doctors and artists should overlap with engineers to the extent they do.

TABLE II.—PERCENTAGES OF MEN IN VARIOUS OCCUPATIONS WHO RATE A AND B IN THE INTEREST OF CERTIFIED PUBLIC ACCOUNTANTS, ENGINEERS, AND PERSONNEL MANAGERS

	Certified public accountant		Engineer		Personnel manager	
	A	B	A	B	A	B
Certified public accountant	74	25	2	28	3	31
Banker	20	39	2	31	0	12
Office worker	2	39	7	25	2	24
Lawyer	5	23	5	25	7	40
Engineer	2	21	75	25	3	31
Personnel manager	6	13	6	33	75	25
Author	2	16	4	18	2	10
School teacher	2	15	8	29	4	31
Life insurance salesman	4	12	0	29	5	30
Advertising man	0	10	..	..	6	38
Doctor	0	8	9	42		
Minister	0	0	0	10	2	34
Artist	0	0	4	29	0	0
Line executive	..	..	..	..	7	32
Department store salesman	....	..	..	..	0	14

EXTENT TO WHICH CERTIFIED PUBLIC ACCOUNTANTS RATE IN OTHER OCCUPATIONAL INTERESTS

The first 49 records that were received of the entire 99 certified public accountants were selected for more intensive study. As shown in the first chart of Fig. 3 these 49 men score slightly higher

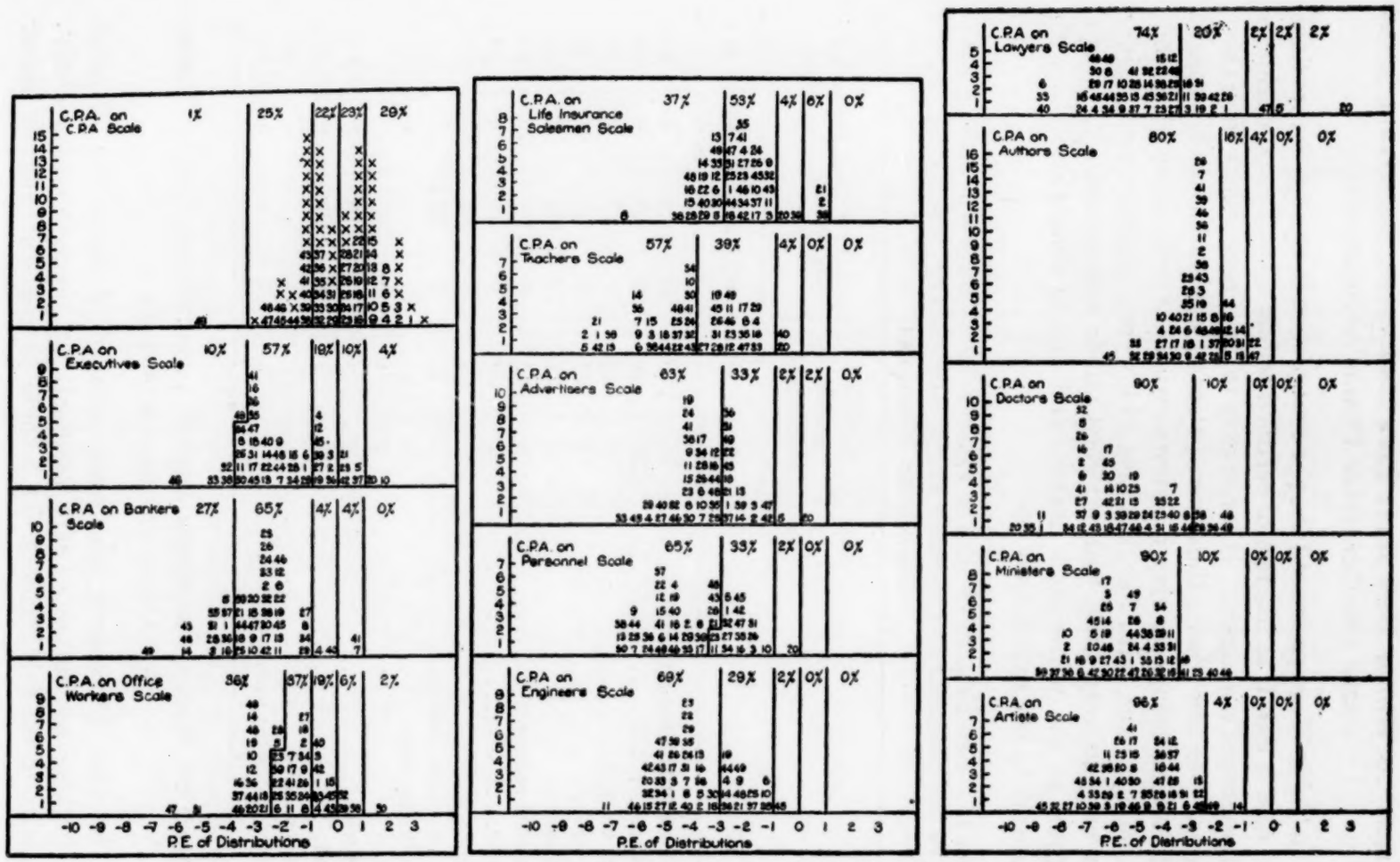
C.P.A. on C.P.A Scale
C.P.A. on Executives Scale
C.P.A on Bankers Scale
C.P.A. on Office Workers Scale
C.P.A. on Life Insurance Salesmen Scale
C.P.A. on Teachers Scale
C.P.A. on Advertisers Scale
C.P.A. on Personnel Scale
C.P.A on Engineers Scale
C.P.A. on Lawyers Scale
C.P.A on Authors Scale
C.P.A on Doctors Scale
C.P.A. on Ministers Scale
C.P.A. on Artists Scale
P.E. of Distributions

FIG. 3.—Distributions of scores of 49 certified public accountants for interest in fourteen occupations.

than the remaining 50 *i.e.*, 29 per cent fall in the first quarter, 23 per cent in the second, 22 per cent in the third, 25 per cent in the fourth, and 1 per cent outside the group distribution.

So that the reader, if he desires, can study the records of individual certified public accountants, each of the 49 is shown by the same number in all of the charts in Fig. 3. Thus, No. 1 scored +275 in certified public accountant interest, −1.25 in executive interest, −4.25 in banking interest, −.75 in the interest of office workers, etc.

Certified public accountants score most like executives, bankers, office workers, and life insurance salesmen and they score least like artists, ministers, doctors, authors and lawyers. The explanation of all this is not clear.

Another fact brought out by the data is that certified public accountants rate A or B in these occupations twice as often as men in these occupations rate A or B in certified public accounting.

Since the federal income tax was established the public accountant has increasingly come to perform duties formerly assigned to lawyers. Today there is genuine competition between the two groups. It is interesting to note that only 5 per cent of lawyers rate A in certified public accountant interest and only 6 per cent of certified public accountants rate A in law. Twenty years hence it will be of interest to observe whether this small per cent of overlapping is not materially increased, as each profession takes over part of the work of the other.

The correlations between ratings in certified public accountant interest and interest in the other 13 occupations are given in the first column of Table III. They are all so low as to be of no significance, except that apparently there is no tendency for the certified public accountants who score high or low in their own occupational interest to score high or low in any other occupational interest.

Corresponding correlations in the case of engineers and personnel managers are given in columns two and three of this table. Apparently the higher engineers score in engineering the greater the chance of scoring significantly as an executive but in reverse manner for teaching and preaching. In the case of personnel managers, those who score high are more likely to be rated also as lawyers and more unlikely to be rated as bankers or engineers.

FIG. 3.—Distributions of scores of 49 certified public accountants for interest in fourteen occupations.

TABLE III.—CORRELATIONS BETWEEN SCORES OBTAINED BY CERTIFIED PUBLIC ACCOUNTANTS, ENGINEERS AND PERSONNEL MANAGERS IN THEIR OWN AND OTHER OCCUPATIONAL INTERESTS

	Certified public accountant	Engineer	Personnel manager
Certified public accountant	1.00	−.21	.10
Line executive	.31	.37	.15
Lawyer	.19	−.36	.47
Banker	.16	−.09	−.39
Advertising man	.13	.08	.30
Engineer	.13	1.00	−.36
Office worker	.12	−.26	−.26
Author	.06	.06	.14
Artist	.03	−.01	−.23
Life insurance salesman	.01	−.08	.31
Personnel manager	.00	−.30	1.00
Minister	−.14	−.52	−.10
School teacher	−.25	−.51	.00
Doctor	−.30	.21	
Department store salesman	....	....	−.04

VOCATIONAL GUIDANCE OF 49 CERTIFIED PUBLIC ACCOUNTANTS

Suppose these 49 public accountants should accept the findings of this interest test, how many would remain in their present profession and how many would change to another? Twenty-two (45 per cent) were rated A in certified public accountant and only B or C in any other occupation. Seven men were rated A in both certified public accountant and office work; they must needs choose between the two. Similarly 3 must choose between certified public accountant and selling life insurance; 1 between certified public accountant and banking; 1 between certified public accountant and being an author; 1 among certified public accountant, banking and office work; 1 among certified public accountant, advertising and law, and 1 among certified public accountant, selling life insurance, teaching, advertising, personnel work and law. Counting one-half a man entering certified public accountant work when there is a choice between 2 occupations and one-third a man when there is a choice among 3 occupations, then from these 15 men 6.8 (14 per cent) would become certified public accountants. Three men were rated B in certified public accountant and also B in 2 or more other occupations. Together they contribute

0.7 man (1.4 per cent) more toward accounting. This gives a total of 29.5 men (61 per cent) who remain certified public accountants.

Eight men were rated B in certified public accountant and A in 1 or more other occupations. Three of these would become officer workers, 1 a life insurance salesman, 1 a banker, 1 would choose between law and authorship, 1 between office work and engineering, 1 among banking, office work and teaching. Our last man, rated C in certified public accountant would choose among teaching, advertising, engineering, doctoring and the work of an artist—in all of which he rated only B.

It is generally supposed that many men are not fitted for the work they are doing. Whether 61 per cent of these 49 certified public accountants are properly located in that profession cannot be determined.

Our group of personnel managers were given their ratings and asked to comment on them. A high correlation between the test ratings and their opinions was obtained. Although this is flattering to the test results it cannot be accepted as scientific confirmation. Few of us are in a position to know whether or not we actually would like a dozen different professions, nor can the accuracy of our prophetic feelings be counted upon.

Possibility of Using an Interest Test in Vocational Guidance

All of the data presented here are based upon men who are successfully pursuing their occupation. The question naturally arises: Is it not possible that men acquire these likes and dislikes that characterize their occupational group and that if they changed their occupation they would change their likes and dislikes? If this were so the interest test would be of little value in determining what occupation a man should enter.

Cowdery finds that the five groups—(*a*) freshmen and sophomores planning to be engineers, (*b*) juniors and seniors in engineering school, (*c*) engineers in graduate work, (*d*) engineers with less than five years practical experience and (*e*) engineers with more than five years practical experience—all score approximately the same on the interest test. The same holds true with respect to physicians and lawyers. "This fact," he writes, "is established for groups; whether true for individuals remains to be investigated in later research." If all this is correct it means that what is measured by this test is present in men prior to technical training and practical experience and

presumably leads to their vocational choice and is not a resultant of that vocational choice.

The data presented here and elsewhere indicate that members of each occupational group have characteristic likes and dislikes that distinguish them from other occupational groups.

The method employed here of measuring these interests is new. Apparently its use will lead to significant findings in the field of vocational guidance.

OVERSTATEMENT AS A TEST OF GENERAL CHARACTER IN PRE-SCHOOL CHILDREN

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The experiment here reported was conducted as a preliminary test of the feasibility of measuring development in general character in pre-school children. The term "general character," no less than the familiar "general intelligence," is admittedly a vague expression. As here understood, degree of development in general character means the average development attained in all desirable specific traits of character, weighted, perhaps, according to social standards of their importance. The number of these specific character traits is very large. A list which includes only a small proportion of the total number of these traits, but which nevertheless embraces as many as two hundred of them, chosen as presumable constituents of that aspect of character called "good citizenship," has been compiled by Upton and Chassell.[1] Each of these hundreds of traits is presumably quite complex, like the traits of self-assurance and speed of decision, studied experimentally by Filter.[2] It is no doubt desirable to have methods of measuring as many as possible of these specific traits, but this fact does not lessen the desirability of ascertaining whether it may not be feasible to measure general character. As regards this possibility, we have made a brief and simple investigation, in the case of pre-school children.

Our study consists in the determination of the correlation shown by general character, rated under conditions which yielded fairly satisfactory reliability coefficients, with a test of a single, rather definite aspect of character—namely, the tendency towards overstatement. It has been established by previous investigators that, with children older than those here considered, overstatement scores are related, to a moderate degree, with ratings of various broad aspects of character. Voelker[3] thought the overstatement test to be the best

[1] Upton, Siegried, and Chassell, Clara: A Scale for Measuring the Importance of Habits of Good Citizenship. *Teachers College Record*, 1919, Vol. XX, 52–79.

[2] Filter, R. O.: An Experimental Study of Character Traits. *Journal Applied Psychology*, 1922, V, pp. 297–317.

[3] Voelker, P. F.: The Function of Ideals in Social Education. *Teachers College Contributions to Education* No. 112, 1921.

of his battery for the measurement of "trustworthiness;" Cady[1] found the test to show a correlation of +.41 with ratings of "corrigibility" and considered it to be probably his best test; while Raubenheimer[2] found the test of value in differentiating "potential delinquency" from reliability, stability and healthy mindedness. Probably not too sharp a distinction should be drawn between these various rubrics. The test seems to function about as satisfactorily under one of them as under another. None of them refers to a specific, unanalyzable trait. Possibly, such a trait as delinquency may, from the social viewpoint, be given a fairly definite and specific meaning; but certainly as regards the mental and physical properties of delinquent individuals, the term includes an extremely great variety of combinations. These previous studies, then, taken together, strongly suggest that overstatement, though apparently a fairly narrow and definite trait, must nevertheless be related to some broadly inclusive portion of character. The present study aims to supplement previous ones by determining how closely overstatement is related to character as a whole. A high correlation with ratings in general character would be evidence of a considerable degree of integration among the many aspects of character and would, therefore, indicate the feasibility of a measurement of general character.

Pre-school children were used in the present study because of the desirability of obtaining an idea of the possible range of ages to which the overstatement test might be advantageously adapted. The existing forms of the test are intended primarily for children of the age of ten or above. In case the test is found to possess value as a character test in children of pre-school age, it is practically certain that other forms of it could be devised which would be suitable for children of the intermediate ages of six to ten; and, consequently, a character test should result, forms of which could be used with children of any age above four[3]—a range of applicability greater than that of any existing character test.

Our investigation was carried out with 2 groups of children. The first was a group of 17 five-year-olds, composing a kindergarten class in a St. Paul public school. This class possessed 2 teachers, both of

[1] Cady, V. C.: The Estimation of Juvenile Incorrigibility. *Journal of Delinquency Monographs* No. 2, 1923.

[2] Raubenheimer, A. S.: An Experimental Study of Some Behavior Traits of the Potentially Delinquent Boy. *Psychological Monographs*, Vol. XXXIV, No. 6.

[3] The writers are now engaged in a study of overstatement in children of the ages eight and nine.

whom had been in daily contact with the pupils for over 7 months at the time they were asked to rate the children as regards "goodness" of general character. The results obtained with this class were so definite that it was decided to repeat the experiment during the summer with a group of children, near 4 years of age, enrolled in the Minnesota Institute for Child Welfare. Approximating this age—the oldest represented in the institute—there were 14 children. Independent ratings of this group as regards goodness of character were secured from 3 teachers.

The description of the 2 groups as regards age and intelligence is summarized by the following data. Mental ages were determined by the Kuhlmann scale.

	Kindergarten group			Institute group		
	Average	Mean variation	Range	Average	Mean variation	Range
Chronological Age (months)	65	4.05	52–72	46	7.7	28–58
Mental Age (months)	65.5	4.4	51–73.5	58	10.4	26–80
IQ	1.00	.10	.72–1.27	1.26	.14	.91–1.45

Since the overstatement tests hitherto published are designed for children of about 10 to 15 years of age, it was necessary to devise new, and much simpler, forms. On account of mental differences between the 2 groups, the test constructed for the four-year group contained, in addition to a majority of the questions devised for the five-year group, a number of still simpler items. The test was given to the children individually, as is necessary at their ages. After spending some time making the child feel at home, the examiner introduced the test as follows: "I'm going to ask you some questions to find out how many things you can do. I want to find out who in your class can do the most. To the one who can do the most I'm going to give this box of candy." The child then answered "yes" or "no" to the following questions, selected from a longer list after preliminary trials with other children.

QUESTIONS FOR FIVE-YEAR-OLDS

1. Can you write your name?
2. Can you hop on one foot?
3. Can you tie a bow?
4. Are you the biggest boy (or girl) in the class?
5. Can you turn a somersault?

6. Can you stand on your head?
7. Can you tell the story of "The Three Little Bears?"
8. Can you tell the story of "Little Boy Blue?"
9. Can you bounce a ball and catch it?
10. Can you count up to ten?
11. Can you put on your shoes, alone, and lace them?
12. Can you show me the color red?

QUESTIONS FOR FOUR-YEAR-OLDS

In addition to the first nine questions already given, the following:

10. Can you count to five?
11. Can you tell time?
12. Can you skip on your toes?
13. Can you telephone alone?
14. Can you draw a picture of a house?
15. Can you read?
16. Can you brush your teeth alone?
17. Can you sing "Sally, Go 'round the Moon?"
18. Have you a baby brother or sister?

After the children had given their verbal answers to the questions, performance tests were given to determine whether the answers were correct. A test was made of the child's actual ability with respect to each of the questions, with the exception of those numbered 16 and 18, the answers to which could be checked by data obtained from the school records. In the majority of cases, failure in a performance test took the form of saying "I can't," without any positive effort. In case of real attempts at performance, the results were graded by liberal standards. Printing of a name was accepted in place of writing. In testing ability to tell stories, all that was required was evidence of general familiarity with the story, and an absence of admixture of other stories. The ability to sing a song was judged similarly. A liberal subjective standard was also used in determining ability to draw a house and ability to read. In testing ability to show the color red, the child was shown the colors red, green, blue and yellow, and asked to pick out the red. For turning a somersault, a pillow was provided. In testing the ability to telephone the child was asked to telephone to its mother, after being given the telephone number.

The test was scored by obtaining the ratio of assertion to execution, that is, by dividing the number of questions answered in the affirmative by the number that should have been so answered according to the performance tests. The smaller this ratio, the better the score. Only one child, a four-year-old, obtained a ratio of less than

one. This means that only one child in the entire two groups understated his abilities. No child either succeeded or failed in all of the performance tests. On the average, the five-year-olds succeeded in 50 per cent of the items, and the four-year-olds in 30 per cent of them. The older group, on the average, gave an affirmative answer to 75 per cent of the questions and the younger group to 51 per cent of them. These figures raise many interesting questions concerning the proper "standardization" of an overstatement test. Among these are the following: What percentage of execution favors the maximum percentage of overstatement? What percentage of overstatement is to be desired? Will a series of items, yielding different average percentages of execution with different age groups yield overstatement scores that are comparable for those different age groups? Should credit be given for understatement? Should the test be scored by taking the ratio of assertion to execution, or by taking the difference between these two? The mere raising of these questions is sufficient to show that the overstatement test is not an altogether simple one. We believe their adequate answer must await the accumulation of more data than are now available.

To determine the validity of the overstatement test as a test of character we made use, as already explained, of teachers' ratings of general character. The reliability of these ratings in character, as well as their correlations with intelligence and age are shown in Table I. In this table (and also in Table II) the two kindergarten teachers are designated Ka and Kb and the three institute teachers, Ia, Ib and Ic. All correlations are calculated by the rank-order method.

TABLE I.—CORRELATIONS OF CHARACTER RATINGS WITH EACH OTHER AND WITH MENTAL AGE, INTELLIGENCE QUOTIENT AND CHRONOLOGICAL AGE

Group		ρ	PE
Kindergarten	Ratings of Ka and Kb	+.69	±.09
Institute	Ratings of Ia and Ib	+.83	±.06
	Ratings of Ia and Ic	+.75	±.09
	Ratings of Ib and Ic	+.64	±.11
Kindergarten	Amalgamated ratings and MA	+.76	±.07
	Amalgamated ratings and IQ	+.54	±.12
	Amalgamated ratings and CA	+.51	±.13
Institute	Amalgamated ratings and MA	−.02	±.19
	Amalgamated ratings and IQ	+.52	±.14
	Amalgamated ratings and CA	−.17	±.18

The coefficient of correlation between the ratings of the two kindergarten teachers is +.69, and the average coefficient between the ratings of the institute teachers is +.74. These correlations, while not as high as could be desired are, in all probability, fully as high as could be obtained with ratings on older children, provided that all the obtained ratings, and not simply the extremes or those of which the rater was "very sure," were retained. The coefficient obtained by Cady[1] for ratings which were "very certain," was +.83, but this dropped to +.44 for the "fairly certain." Webb[2] and Voelker[1] each report average coefficients of +.55.

The coefficients of correlation given in Table I, between character ratings and either MA or IQ, are high, with the exception of the correlation between character ratings and MA for the four-year-olds, which is −.02. This latter correlation is probably due largely to the manner in which the institute group had been selected. That it is not a representative group is shown by the fact that the average IQ is 1.26. The correlation between MA and ratings for the five-year group is +.76. This may seem astonishingly high, but it is probably much nearer what should be expected than the negative correlation found for the four-year-olds. It is exactly the coefficient cited by Terman,[3] as that found between IQ and the average of teachers' ratings of 24 character traits (an average which, according to our definition of general character, should constitute a very good substitute for a rating therein). It might seem that, when general character ratings correlate so highly with intelligence (over +.50 with IQ in each group), it would be useless and perhaps hopeless to devise character tests. That this is not the case, however, is shown by the rather decided partial correlations obtained between character ratings and overstatement, when the coefficients are calculated with intelligence constant. These coefficients of partial correlation, as may be calculated from Table II, average +.46, with IQ constant and +.42 with MA constant.

All of the correlations between character ratings and overstatement are shown in Table II. A positive correlation signifies that the children who are above average in character overstate less than the others. The correlation between amalgamated rank in character and over-

[1] *Op. cit.*

[2] Character and Intelligence. *British Journal of Psychology*, 1915, Monograph Supplement No. 1, p. 27.

[3] Terman, L. M., after Dickson, V. E.: "The Intelligence of School Children," 1919, p. 61.

statement is +.56, for the five-year group, and +.43 for the four-year group. It is interesting to observe that in the institute group, CA and MA, both of which show a negative correlation with the teachers' character rankings, likewise yield a negative correlation with the overstatement test while IQ, which correlates positively with character rankings, likewise correlates positively with overstatement. The partial correlations for the two groups, respectively, are as follows: With IQ constant, +.45 and +.46; with MA constant, +.36 and +.46. These correlations are "raw" coefficients, uncorrected for any sort of errors. They could be raised somewhat. For example, each of the overstatement tests, as given, contained an item which was valueless. We have scored the tests with these items retained,

TABLE II.—RANK-ORDER COEFFICIENTS OF CORRELATION SHOWN BY OVERSTATEMENT SCORES

Ka and Kb Signify Kindergarten Teachers; Ia, Ib and Ic, Institute Teachers

	Measure correlated with overstatement	ρ	PE
Kindergarten group....	Ka's character rankings	+.62	±.10
	Kb's character rankings	+.51	±.13
	Amalgamated character rankings	+.56	±.12
	Amalgamated character rankings (with IQ constant)	+.45	±.14
	Amalgamated character rankings (with MA constant)	+.36	±.15
	MA	+.49	±.13
	IQ	+.40	±.14
	CA	+.21	±.16
Institute group.....	Ia's character rankings	+.45	±.15
	Ib's character rankings	+.36	±.17
	Ic's character rankings	+.47	±.15
	Amalgamated character rankings	+.43	±.15
	Amalgamated character rankings (with IQ constant)	+.46	±.15
	Amalgamated character rankings (with MA constant)	+.48	±.15
	MA	−.49	±.14
	IQ	+.13	±.19
	CA	−.47	±.15

because it is a questionable procedure to use the same set of data both for perfecting a test and for determining its validity. It was found, however, that there was one item in the five-year-old test, question No. 9, which no child overstated. If the overstatement ranks are obtained with this worthless item omitted, their correlation with the amalgamated character ranks is raised from +.56 to +.60. Similarly, there was no overstatement accompanying question No. 16 of the four-year list. Scoring the overstatement test on the remaining 17 questions raises the correlation with amalgamated character ranks from +.43 to +.48. These correlations could, of course, be still further raised by correcting for the fallibility of the criterion.

From the above coefficients of correlation between general character ratings and intelligence, it is obvious that the overstatement test, so far as may be judged from our small experiment, constitutes a very good test of general character in pre-school children. We do not mean by this that, taken alone, it is an adequate test, but that it would not take a large battery of tests as good as this one (providing the intercorrelation between them was moderate) to yield a very satisfactory measure. We interpret our experiment, then, as indicating that pre-school children do possess a ratable "general character," and that the measurement of the latter by means of tests is quite within the reach of further research.

A STUDY OF THE READING PERFORMANCE OF PUPILS UNDER DIFFERENT CONDITIONS ON DIFFERENT TYPES OF MATERIALS

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A number of studies have been made of the effectiveness of different reading procedures. Beauchamp, for example, showed that a more thorough comprehension of large units of elementary science material was secured with directed-study procedures than with undirected study of the same material.[1] Germane found that study with specific problems in mind was more effective than undirected study or re-reading for the same period of time.[2] In Germane's experiment the study problems formed the achievement test. In a recent study reported by Good, two readings were found to yield a greater amount of information than a single reading.[3] Good, however, raises the question whether the superiority of two readings compensates for the additional time spent in reading. In the preceding studies there was no attempt to compare single readings done under different conditions. The present paper is a report of a study in which such an attempt was made.

The Problem

The purpose of the present study is to compare the reading performance of pupils under different conditions on different types of reading materials. More specifically, the problem is a comparison of four single readings when (1) the reading is undirected, (2) when the pupils read to find the answers to a list of eight specific questions given by the experimenter, (3) when the pupils are given a general problem, and (4) when the purpose of the reading is to find the answers to eight questions raised by the pupils as a group. The method of procedure

[1] Beauchamp, Wilbur L.: A Preliminary Experimental Study of Technique in the Mastery of Subject-matter in Elementary Physical Science. Studies in Secondary Education, I, pp. 47–87. Supplementary Educational Monographs, No. 24.

[2] Germane, Charles E.: Outlining and Summarizing Compared with Re-reading as Methods of Studying. Report of the Society's Committee on Silent Reading, pp. 103–112. *Twentieth Yearbook of the National Society for the Study of Education*, Part II.

[3] Good, Carter V.: The Effect of a Single Reading Versus Two Readings of a Given Body of Material. *Journal of Educational Method*, V, 325–329 (April, 1926).

for each of the single readings will be described in a later section of this report.

Selection of Materials

Four types of reading materials were chosen. These were geography, nature, narrative, and poetry. Although many other kinds of reading matter could have been included, for the sake of convenience in rotating the reading selections with the reading procedures, the number of selections was limited to the number of reading procedures used in the experiment. The reading selections were:

Geographical.—Winslow, I. O.: *Nitrate.* Taken from our American Neighbors, pp. 162–164. (Length, 478 words.)

Nature.—Beardsley, Herbert: Long-tailed Fowls. *Nature Magazine,* p. 220, April, 1924. (Length, 443 words.)

Narrative.—Watson, Virginia: Incident selected from *With LaSalle, the Explorer,* pp. 69–71. (Length, 535 words.)

Poetry.—Southey, Robert: "The Battle of Blenheim." (Length, 352 words.)

Method of Measuring Reading Performance

The content of each of the preceding selections was of a factual nature. This was a desirable feature since the reading procedures were to be compared on the basis of number of facts recalled by the pupils. A test of 30 questions was constructed for each type of material, each question being formulated in such a way that it called for a specific fact and could be answered with one word. The reading selections and tests were given to 95 pupils of Grade VIa. Another application of the same materials to the same pupils followed a week later. The self-correlations between the two sets of measures obtained with each test are as follows: Geography, .830; nature, .791; narrative, 811; poetry, .787. These correlations appeared to be sufficiently high for the purpose of the study.

Experimental Subjects

The subjects of the experiment were ten classes of Grade VIa of seven elementary schools of Minneapolis. Two classes were used for each type of procedure. The remaining two classes constituted a check group. In all, then, there were five groups, hereafter designated as A, B, C, D, and E. A later section describes the method of equating the five groups.

Method of Experimentation—General Plan of Procedure

Since the experiment involved four reading selections and four reading procedures, it was necessary to devise a technique or plan whereby each material would be treated with each procedure. This plan is presented in Table I.

Table I.—General Plan of Experimental Procedure[a]

Group	Reading materials			
	Geographical	Nature	Narrative	Poetry
A	U	U	U	U
B	U	SQ	P	RQ
C	RQ	U	SQ	P
D	P	RQ	U	SQ
E	SQ	P	RQ	U

[a] Reading procedures are abbreviated for convenience as follows: U = Undirected Procedure; SQ = Specific Questions Procedure; RQ = Raised Questions Procedure; P = Problem Procedure.

Table I shows that the two classes in Group A were given all reading materials with the Undirected Procedure. Group A, therefore, served as a check on the other groups. Groups B, C, D and E used a different procedure on each type of material. Thus it was possible to compare, on each type of material, the number of facts recalled and time spent in reading with the use of the four procedures. The rotation method also made it possible to combine the results for each procedure on all types of materials, since each procedure occupied each of the four positions in the order of presenting the materials. The various materials were given on successive days and were presented to the groups in the order in which they appear in Table I.

The various procedures will be described in the succeeding paragraphs. Lack of space will not permit the reproduction of the problems or questions used by the pupils in reading the selections. It should be said that in the case of the Raised Questions Procedure, the questions were not identical for the two classes comprising a group. In general, however, the questions raised by the two classes in a group were very similar.

Undirected Procedure

With the Undirected Procedure no attempt was made to stimulate or motivate the pupils' reading. The subjects were merely told to read the selection through once, and then to answer the questions, which were on the pupils' desks but kept separate from the reading material. The following instructions for the geographical selection were given verbally by the writer:

"Today we are going to read a story about nitrate. Read the story through once. When you have finished look at the blackboard and write above your name the number you see. Then place the story face-downwards on your desk, turn over the test papers and write the answers to the questions. Each question can be answered with one word. Turn over the story. Begin."

These directions were given twice. Similar directions were given with the nature, narrative and poetry materials.

Raised Questions Procedure

The writer has often observed the use of this procedure by teachers of elementary classes. One of the reasons given for its use is that it provides for purposeful reading. The verbal instructions which were given with the Raised Questions Procedure are as follows:

"Today we are going to read a story about nitrate. What would you like to find out about nitrate when you read?" (Eight questions suggested by the pupils were written on the blackboard.) "When the signal to begin is given turn over the story and find the answers to the questions you have asked as you read. When you have finished look at the blackboard and write above your name the number you see. Place the story face-downwards on your desk. Then turn over the test papers and write the answers to the questions. Each question can be answered with one word. Begin."

These directions were given twice. The foregoing directions were also used with the nature, narrative, and poetry selections.

Problem Procedure

With this procedure a general thought question was given to the pupils to motivate their reading. The following verbal instructions were given with the geographical selection:

"Today we are going to read a story about nitrate. As you read find the answer to the problem which I have written on the blackboard. When you have finished look at the blackboard and write above your name the number you see. Then place the story face-downwards on your desk, turn over the test papers and write the answers to the questions. Each question can be answered with one word. Turn over the story. Begin."

These directions were given twice. The same directions were used with the nature, narrative, and poetry selections.

Specific Questions Procedure

With the Specific Questions Procedure the reading was motivated by giving the pupils a list of eight mimeographed questions. The following oral directions were also given:

"Today we are going to read a story about nitrate When the signal is given to begin turn over the story and the sheet with the questions. As you read find the answers to the questions. When you have finished look at the blackboard and write above your name the number you see. Then place the story and study questions face-downwards on your desk, turn over the test papers and write the answers to the questions. Each question can be answered with one word. Begin."

The directions given with the other materials were the same as those given with geography.

Method of Securing Time

Owing to individual variations in rate of reading and to possible differences in the time required for the four procedures, it seemed best to allow each pupil a sufficient amount of time to go through a given procedure once at his own rate. The amount of time consumed by each pupil, however, was secured for each procedure. After the signal was given to begin the writer wrote on the board at intervals of five seconds, the number denoting the amount of time which had elapsed. With the expiration of five seconds, the number on the blackboard was erased and a new number written in its place. Each pupil obtained his own time by simply recording the number on the board at the time he finished. No record was made of the time spent in mimeographing the specific questions or of the time spent by a group in raising its own questions for study purposes.

Method of Securing Equivalent Groups

In equating the five groups of pupils a composite of the scores of several standardized tests was used. These tests were as follows: Haggerty Intelligence Examination, Delta 2, Haggerty Reading Examination, Sigma 3, Monroe Silent Reading Test, No. 2, Thorndike-McCall Reading Scale, Form 2.

The composite scores were obtained in the following manner. Distributions of the test scores were made for the pupils in all groups

combined. After computing the standard deviations of the distributions, multipliers were selected which would make the variabilities of the different tests approximately equal. The scores on a test were then multiplied by the multiplier selected for that test.

Finally, the procedure for equating the groups consisted in distributing the pupils of each group according to composite scores. By a process of matching scores fifty cases were selected from each group. The medians, means, and standard deviations for composite scores are given for each group in Table II.

TABLE II.—MEDIANS, MEANS, AND STANDARD DEVIATIONS OF GROUPS A, B, C, D, AND E ON COMPOSITE SCORES

	A	B	C	D	E
N	50	50	50	50	50
Md	410.0	412.5	413.3	412.0	413.3
M	414.8	418.0	416.4	415.6	416.0
SD	55.7	57.2	55.3	55.6	55.6

Table II shows that the central tendencies and variabilities of the groups are practically identical as far as composite scores are concerned. The data presented in the following sections are based on the equated groups.

COMPARISON OF PROCEDURES

Summaries of the results on the geographical, nature, narrative, and poetry selections are given in Table III–VI, inclusive.

TABLE III.—MEANS AND STANDARD DEVIATIONS FOR IMMEDIATE RECALL AND TIME OF GROUPS A, B, C, D, AND E USING DIFFERENT PROCEDURES ON GEOGRAPHICAL SELECTION

Group	Procedure	Mean		SD	
		Recall	Time	Recall	Time
A	U	14.5	147.0	4.8	46.4
B	U	11.8	136.4	5.1	44.0
C	RQ	15.0	160.2	4.9	55.0
D	P	14.3	157.4	5.8	45.2
E	SQ	13.0	218.4	5.1	79.4

TABLE IV.—MEANS AND STANDARD DEVIATIONS FOR IMMEDIATE RECALL AND TIME OF GROUPS A, B, C, D, AND E, USING DIFFERENT PROCEDURES ON NATURE SELECTION

Group	Procedure	Mean		SD	
		Recall	Time	Recall	Time
A	U	13.0	142.4	4.3	37.9
B	SQ	14.4	174.8	5.0	57.9
C	U	16.7	147.4	4.7	36.6
D	RQ	14.9	166.6	5.1	55.8
E	P	15.7	163.4	5.2	52.0

TABLE V.—MEANS AND STANDARD DEVIATIONS FOR IMMEDIATE RECALL AND TIME OF GROUPS A, B, C, D, AND E USING DIFFERENT PROCEDURES ON NARRATIVE SELECTION

Group	Procedure	Mean		SD	
		Recall	Time	Recall	Time
A	U	18.1	174.0	5.3	54.3
B	P	19.5	162.0	4.9	43.2
C	SQ	21.5	206.0	4.9	66.6
D	U	19.0	179.0	5.2	56.4
E	RQ	21.8	188.0	4.8	55.4

TABLE VI.—MEANS AND STANDARD DEVIATIONS FOR IMMEDIATE RECALL AND TIME OF GROUPS A, B, C, D, AND E USING DIFFERENT PROCEDURES ON POETRY SELECTION

Group	Procedure	Mean		SD	
		Recall	Time	Recall	Time
A	U	14.8	128.2	4.9	38.1
B	RQ	17.5	135.4	4.1	44.7
C	P	18.3	131.2	4.1	36.3
D	SQ	16.7	163.0	5.6	55.3
E	U	17.4	140.8	4.6	36.2

Table III shows that Group C, Using the Raised Questions Procedure, has the highest mean recall score on the geographical material. Of particular interest in this table is the difference between the recall

scores of Groups A and B. Group A has next to the highest score whereas Group B has the lowest. Assuming that these groups were of equal ability the results should have been the same, since both groups used the Undirected Procedure. A possible explanation for the recall difference may be the greater amount of time expended by Group A.

The time data given in Table III reveal large differences in the groups. For example, the mean number of seconds consumed under the Undirected Procedure, when used by Group B, was 136.4 seconds, as compared with 218.4 seconds for the Specific Questions Procedure. The groups using the most time were those in which attention was directed to the content of the material read. A similar tendency may be noted on the nature, narrative, and poetry selections.

An examination of the mean recall scores in Tables IV–VI, inclusive, show that Group A was exceeded by Groups B, C, D, and E on the nature, narrative, and poetry materials. That is, in terms of number of facts recalled, the results of groups using directed procedures as well as the Undirected Procedure were greater than the results of a group always using the Undirected Procedure. Furthermore, when the Undirected Procedure was used by Groups C, D, and E on the nature, narrative, and poetry materials, respectively, the results in mean recall were practically comparable to the results secured with the directed procedures. It would appear, therefore, that Groups C, D, and E obtained more facts than Group A because of their experience with the motivated procedures. Although the former groups used more time than Group A, the time differences do not appear large enough to have accounted for the differences in the recall scores.

On the basis of the data presented in Tables III–VI, inclusive, one would hesitate to conclude that a particular reading procedure is superior to other procedures on a given type of material. For example, the results of Group C are consistently superior regardless of the procedure used. This fact may be better observed in Table VII in

TABLE VII.—MEANS IN IMMEDIATE RECALL AND TIME AVERAGED FOR GROUPS B, C, D, AND E

Group	Average recall	Average time
B	15.8	152.1
C	17.9	161.2
D	16.2	166.5
E	17.0	177.7

which averages are given of the recall means and time means secured by Groups B, C, D, and E with all procedures.

The largest recall difference is between the averages of Groups B and C. A possible reason for the relatively low recall average of Group B may be due to the fact that this group consumed less time on the average than Groups C, D, and E. The superiority of Group C could hardly be attributed to the time factor, since both groups D and E used on the average more time. It seems possible, therefore, that the differences in mean recall on a given material may have been due to differences in the abilities of the groups.

If, on the other hand, the results for each procedure on all materials are averaged, the factor of inequalities in the groups would tend to be eliminated, since each group used a different procedure on each type of material. The averages of the mean recall and time scores are given by procedures in Table VIII.

TABLE VIII.—MEANS IN IMMEDIATE RECALL AND TIME AVERAGED BY PROCEDURES

Procedure	Geography		Nature		Narrative		Poetry		Average	
	R	T	R	T	R	T	R	T	R	T
U (A)	14.5	147.0	13.0	142.4	18.1	174.0	14.8	128.2	15.1	147.9
U	11.8	136.4	16.7	147.4	19.0	179.0	17.4	140.8	16.2	150.9
RQ	15.0	160.2	14.9	166.6	21.8	188.0	17.5	135.4	17.3	162.6
P	14.3	157.4	15.7	163.4	19.5	162.0	18.3	131.2	17.0	153.5
SQ	13.0	218.4	14.4	174.8	21.5	206.0	16.7	163.0	16.4	190.6

R = Recall, T = Time, U (A) = Undirected Procedure, used by Group A.

Table VIII shows that the average of the geography, nature, narrative, and poetry recall means for the Undirected Procedure, when used by Group A, is 15.1. The averages for the Undirected, Raised Questions, Problem, and Specific Questions Procedures when used by Groups B, C, D, and E are 16.2, 17.3, 17.0 and 16.4, respectively. If we exclude Group A, the differences in the recall averages are small. Indeed, they are less than the differences in the recall averages by groups shown in Table VII. The differences in the time averages are not large if the Specific Questions average is excluded.

The relatively large expenditure of time with the Specific Questions Procedures as compared with Raised Questions may have been due to the proximity of the mimeographed questions; that is, the pupils may have attended more closely to the mimeographed questions than

TABLE IX.—DIFFERENCES IN MEAN RECALL AND MEAN TIME

Groups	Material	M recall difference	M recall difference / σ difference	M time difference
C(RQ)-A(U)	Geography	+ .5	.67	+13.2
D(RQ)-A(U)	Nature	+1.9	1.98	+24.2
E(RQ)-A(U)	Narrative	+3.7	4.56	+14.0
B(RQ)-A(U)	Poetry	+2.7	3.33	+ 7.2
C(RQ)-B(U)	Geography	+3.2	4.06	+23.8
D(RQ)-C(U)	Nature	−1.8	1.71	+19.2
E(RQ)-D(U)	Narrative	+2.8	3.37	+ 9.0
B(RQ)-E(U)	Poetry	+ .1	.16	− 5.4
D(P)-A(U)	Geography	− .2	.23	+10.4
E(P)-A(U)	Nature	+2.7	3.11	+21.0
B(P)-A(U)	Narrative	+1.4	1.45	+12.0
C(P)-A(U)	Poetry	+3.5	4.53	+ 3.0
D(P)-B(U)	Geography	+2.5	2.55	+21.0
E(P)-C(U)	Nature	−1.0	1.20	+16.0
B(P)-D(U)	Narrative	+ .5	.57	+17.0
C(P)-E(U)	Poetry	+ .9	1.07	− 9.6
E(SQ)-A(U)	Geography	−1.5	1.91	+71.4
B(SQ)-A(U)	Nature	+1.4	1.73	+32.4
C(SQ)-A(U)	Narrative	+3.4	3.79	+32.0
D(SQ)-A(U)	Poetry	+1.9	2.02	+34.0
E(SQ)-B(U)	Geography	+1.2	1.38	+82.0
B(SQ)-C(U)	Nature	−2.3	3.08	+27.4
C(SQ)-D(U)	Narrative	+2.5	2.84	+27.0
D(SQ)-E(U)	Poetry	− .7	.82	+22.2
C(RQ)-E(SQ)	Geography	+2.0	2.55	−58.2
D(RQ)-B(SQ)	Nature	+ .5	.49	− 8.2
E(RQ)-C(SQ)	Narrative	+ .3	.40	−18.0
B(RQ)-D(SQ)	Poetry	+ .8	.90	−27.6
D(P)-E(SQ)	Geography	+1.3	1.46	−61.0
E(P)-B(SQ)	Nature	+1.3	1.57	−11.4
B(P)-C(SQ)	Narrative	−2.0	2.90	−44.0
C(P)-D(SQ)	Poetry	+1.6	1.49	−31.8
C(RQ)-D(P)	Geography	+ .7	.88	+ 2.8
D(RQ)-E(P)	Nature	− .8	.86	+ 3.2
E(RQ)-B(P)	Narrative	+2.3	3.09	+26.0
B(RQ)-C(P)	Poetry	− .8	.97	+ 4.2
B(U)-A(U)	Geography	−2.7	3.73	+10.6
C(U)-A(U)	Nature	+3.7	4.55	+ 5.0
D(U)-A(U)	Narrative	+ .9	.91	+ 5.0
E(U)-A(U)	Poetry	+2.6	3.37	+12.6

to the raised questions, which were written on the board. Or, the latter may have required less time because the questions were raised by the pupils and, consequently, they were already familiar with them.

A more critical examination of the results may be made by referring to Table IX. The differences in the groups in both recall and time are given. The reliability of a recall difference is indicated by the ratio of the difference to the sigma of the difference.

Table IX shows that the mean recall difference between Group C, using the Raised Questions Procedure, and Group A, using the Undirected Procedure, is .5 in favor of the Raised Questions Group. The ratio of the mean recall difference to the sigma of the difference is .67. The mean time difference shows that Group C used 13.2 seconds more time than Group A. The remaining differences and ratios should be read in the same manner. It will be noticed that seven of the differences in mean recall between the Raised Questions Procedure and the Undirected Procedure are in favor of Raised Questions. The latter procedure, however, required more time. If we take a difference which is three times its sigma as indicating satisfactory reliability, only four of the differences in mean recall are reliable. A comparison of the Problem and Undirected Procedure shows that with the former more facts were recalled but not without a greater expenditure of time. Six of the recall differences are positive but only two of them are three times their sigmas.

The Specific Questions is higher than the Undirected Procedure in five out of eight comparisons. Only two of the differences are significant. When the Raised Questions and Problem Procedures are compared with Specific Questions there is a certainty in the direction of the recall differences, although none of the differences are significant. With respect to time there is no mistaking the direction of the differences. There appears to be little difference in recall between the Raised Questions and Problem Procedures except on the narrative material. In this case, there is a significant difference in favor of the Raised Questions Group. This difference may have been due to the difference in time.

An inspection of the recall differences between Groups B, C, D and E, using the Undirected Procedure, and Group A, using the Undirected Procedure, reveals three differences in favor of the former groups. Two of these differences are significant. The difference in favor of Group A is also significant. Although Groups B, C, D and E consumed more time than Group A, the differences are small.

Summary

1. The immediate recall of the groups reading with specific questions, raised questions, and a problem exceeded the immediate recall of a group doing only undirected reading in 10 out of 12 comparisons. Five of the differences were three times their sigmas. The former groups, however, required more time than the undirected group.

2. The immediate recall of the groups reading with specific questions, raised questions and a problem was greater than the immediate recall of the same groups doing undirected reading in 8 out of 12 comparisons. Only one difference was three times its sigma. The Directed Procedures required a greater expenditure of time.

3. From the point of view of immediate recall the undirected reading of Groups, C, D and E seems to have been favorably affected by their experience with the directed procedures.

4. Although the differences in immediate recall were insignificant, there was a tendency for the Raised Questions and Problem Procedures to exceed the Specific Questions Procedure in immediate recall. Considerably more time was consumed with the Specific Questions Procedure than with the Raised Questions and Problem Procedures.

5. There was very little difference in the Raised Question and Problem Procedures. The fact that the Raised Procedure was significantly higher on the narrative selection may have been due to the appreciable difference in time expended.

Conclusion

On the basis of the data given in the foregoing pages, certain tentative conclusions may be ventured:

1. If the purpose is to measure the immediate recall on the entire content of a selection after a single reading, it appears doubtful whether types of reading directing attention to the content can be justified in view of the relatively large amount of time required for reading.

In addition to the time actually spent in reading, directed procedures require additional time for raising questions, mimeographing or writing questions on the blackboard. Time thus spent was not accounted for in the present study. It may be that undirected reading for the same period of time would be no more effective.

2. Reading with a problem or with questions may be used when definite information is desired. When thus used, directed types of reading are intrinsically worth while in that they develop habits of reading effectively for different purposes.

THE PLAY BEHAVIOR OF FIFTY GIFTED* CHILDREN

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There has been a great deal of speculation regarding the play behavior of gifted children. One of the most recent studies of the play of gifted children was made by Terman.[1,2] The subjects rated 90 play activities with respect to their interest in them, their knowledge of them, and the time devoted to them. Terman concluded that "the gifted are somewhat less interested than the control pupils in intellectual and sedentary games."[3]

The present writers have secured extensive play data from fifty children of IQ 140 or above (Stanford Revision of the Binet-Simon Test Rating). It was felt that intensive study of a relatively small group would lead to salient results. Forty-two of these children were identified in Grades III to VII of the public schools of Kansas City, Missouri; eight were chosen from neighboring towns. Each gifted child was paired with a mentally average child (IQ 90–110) of like age, sex, and environment. Effort was made to secure average children in reference to mental age, educational age, and school progress. The study was conducted in January, 1926. Nine months previously a similar study was made by the writers, using practically the same group of gifted children. In the first study the pairing device was not utilized. Comparisons were made with general standards obtained from large groups of unselected children. It was found, however, that the results of the two studies tended to corroborate each other.

The Stanford Achievement Test, Form *A*, was employed to measure educational attainment of the gifted children. The mean subject quotient (subject age divided by chronological age) was computed for each section of the test. The means ranged from 128–153. The highest mean was for reading, the next highest language usage, the lowest spelling. The children indicated that reading was the best liked subject and spelling the least liked. The mean educational quotient was 132.8. This signifies that the typical child in the group studied had already mastered the subject-matter 32.8 per cent of his

* The term "gifted" as here employed posits IQ of 140 or above (Stanford Revision of Binet-Simon Test Rating). No other implications are intended by the writers.

age beyond the norm for his age. The progress quotient for the group was 114. The typical child in the group was accelerated in actual school progress, therefore, 14 per cent of his age. The difference between 32.8 per cent and 14 per cent is 18.8 per cent. The typical gifted child in this group was under-promoted 18.8 per cent of his actual educational age. He was held back redoing work that he already knew and pursuing methods already mastered. Such findings corroborate those of Terman and De Voss.[4]

Data regarding the play behavior of the children were obtained by means of the Lehman Play Quiz. Each child was asked to indicate among a comprehensive and catholic list of 200 activities *only those* in which he had engaged *during the preceding week*. The children were later asked to designate the activities in which they had participated *alone*. The children were finally asked to indicate the three activities which they liked best and the one activity to which they thought they had given the most time.

For each child the total number of play activities engaged in was determined. The number participated in with one or more additional children was next determined. The percentage of the total activities that the social activities represented was designated the index of social participation. Thus, an index of social participation of 80 indicates that 80 per cent of the activities engaged in by the child were ones in which one or more other children also took part. By this method a high index of social participation signifies that the child in question is relatively social in his play. A low index of social participation means that the child is relatively solitary in his play.

Versatility of Play Interest

The gifted group was compared with the control in reference to the number of activities in which the two groups took part. The median for the gifted group was 56. For the control group the median was also 56. When the data were assembled by sex it was found that the gifted girls engaged in a somewhat larger number of play activities than average girls, but that the gifted boys engaged in a slightly smaller number of activities than average boys. The writers feel that the differences are insignificant as the differences were small.

When the group of gifted children was considered as a whole, it was found that the median number of activities participated in was exactly the same as the median for the control group. The two

groups of widely varying IQ did not differ in the *number* of play activities in which they engaged. The individual differences in this regard, however, were conspicuous.

Social Participation

Indices of social participation were assembled for the two groups. The median for the gifted group was 32.0. For the control group the median was 41.67. The significance of this difference becomes more evident when it is stated that only 26 per cent of the gifted group reached or exceeded the median of the control group. Similar differences between the gifted and the average children were found when the data were partitioned for the sexes. A significant difference appears to exist therefore between gifted and average children in the *kind* of activities engaged in. The gifted children engaged *less frequently* than average children in *social plays and games.*

Activities in Which Gifted Children Most Frequently Take Part

The indices of social participation gave evidence of the tendency of gifted children to turn frequently to solitary games and plays. One logically asks: What are the games and plays in which the gifted group participated more frequently than the average group? The writers found the percentages of each group which took part in the various plays and games. Data were assembled by sex. The gifted children engaged more frequently in every play or game listed in which reading was required. The following table shows the percentages of the two groups of boys taking part in five activities, each of which involves reading. It will be noted that 100 per cent of the gifted boys engaged in each of these activities during the week preceding the investigation.

Table 1.—Percentages of the Two Groups of Boys Who Took Part in Five Activities, Each of Which Required Reading

Name of activity	Gifted boys	Control boys	Per cent difference
Looking at the Sunday "funny" paper	100	96	4
Reading the newspapers	100	88	12
Looking at the daily comic strips	100	83	17
Reading jokes or funny sayings	100	67	33
Reading or looking at magazines	100	75	26

Table II shows the activities in which the two groups of boys differed most in respect to frequency of participation. Data are presented showing the percentages of each group that participated in a given activity, and the differences between the two groups.

TABLE II.—ACTIVITIES IN WHICH THE TWO GROUPS OF BOYS DIFFER MOST IN RESPECT TO PARTICIPATION

A. Activities *More* Commonly Engaged in by the Gifted Boys

Name of activity	Gifted, per cent	Control, per cent	Difference
Reading jokes or funny sayings	100	67	33
Going to entertainments, concerts, etc	50	21	29
Reading or looking at magazines	100	75	25
Doing stunts in the gymnasium	46	29	17
Looking at the daily comic strips	100	83	17
Watching athletic sports	75	58	17

B. Activities *Less* Generally Engaged in by the Gifted Boys

Name of activity	Gifted, per cent	Control, per cent	Difference
Chewing gum	50	88	38
Using a hammer, saw, nails, etc	42	75	33
Running races	46	75	29
Jumping for height	13	46	33
Boxing	13	42	29
Hide and seek	4	25	21
Baseball with a hard ball	21	42	21

Although the gifted boys engaged in approximately the same number of activities as the average boys, they chose more often games which are comparatively solitary and sedentary in nature. Particularly noticeable is the sedentary nature of five of the six activities listed in Table II in which the gifted boys more often engaged than average boys. Those activities in which gifted boys participated less frequently than the control boys are predominantly of a motor type; active, vigorous plays and games.

One of the activities less commonly engaged in by the gifted than by the control group is "Boxing." The following tabulation indicates that the gifted boys were found to box less frequently than average boys.

TABLE III.—PERCENTAGES OF THE TWO GROUPS OF BOYS WHO ENGAGED IN BOXING

	Present study, per cent	Previous study, per cent
Unselected boys	42	31
Twenty-four boys of IQ 140 or above	13	19

These findings do not justify the generalization that gifted boys find less interest in most activities which are motor in nature. Some active, vigorous plays and games were engaged in more often by the gifted boys than by the control boys. "Tennis," "Baseball with an indoor or playground ball," "Doing stunts in the gymnasium," and "Doing gymnasium work," are physical activities in which the gifted group exceeded the control in frequency of participation.

It is, however, particularly noticeable that, although the gifted child engaged in some vigorous plays, he most often turned in his leisure to sedentary activities or moderately active games. It is especially significant that he turned much more frequently than the control boys to activities which involved reading.

Another significant characteristic of the gifted children is revealed by the Play Quiz. The gifted children "chewed gum" less frequently than unselected children. In the present study 38 per cent less of the gifted boys than of the control boys engaged in this activity.

"Teachers testify that gifted children obey rules with less urging, that very little 'police duty' is necessary, that the problem of discipline disappears with the segregation of the gifted pupils, that in comparison with normal children, they are more sensitive to criticism and more susceptible to correction. By way of example a Detroit teacher states that the remark 'Refined people do not chew gum in public, made once to a group of gifted pupils was sufficient, while in a class composed of normal children, exposed to the same suggestion, no fewer than fifteen pupils in the period of one week were asked to remove gum from their mouths."[6]

Miss Davis' conclusion is corroborated by the teachers' judgments of the gifted group studied by the present writers. The teachers reported that 98 per cent of the group responded well to discipline. Only one child seemed to provide difficulty in the classroom in this regard.

Best Liked Activities and Activities Consuming Most Time

The data were assembled in reference to the "best liked activities." For both boys and girls in the gifted group reading books was the activity which was best liked. Eighteen of the 26 gifted girls mentioned reading as the activity most liked. The next most popular activity was mentioned only three times. Only 5 of the 26 control girls indicated reading books to be a favorite activity. Aside from the general agreement upon reading, there was no unanimity among the gifted as to their choices. Versatility of interest and tremendous individual differences were displayed. When the activities involving reading were eliminated, there was little difference between the groups in regard to favorite activities.

Data were obtained in regard to activities to which the children thought they had given the most time. For both the boys and the girls of the gifted group, reading books was mentioned most frequently. Nineteen of the gifted girls and ten of the gifted boys cite reading books as the activity consuming more of their leisure time than any other one activity, while only three girls and one boy in the control groups so responded.

The writers attempted to classify the activities at which the two groups spent the greatest share of their time in five groups from very active plays and games to sedentary ones. When reading activities were eliminated from the list, there were no conspicuous differences between the two groups of children in respect to types of activities consuming the greatest amount of time.

The number and the diversity of the gifted group's favorite play activities and the wide range in the activities reported as consuming the largest amounts of time give convincing evidence that mental superiority does not manifest itself exclusively in an inordinate fondness for reading. The gifted child is interested in reading but he has other interests also.

Summary

Fifty children of IQ 140 and above were selected for intensive study. Each gifted child was paired with a mentally average child of like age, sex, and environment. The two groups were compared and the following results disclosed:

The gifted group and the control group of children demonstrated the same versatility of interest in play and engaged in the *same number* of activities.

The gifted children included in this study were found to be *more solitary* in their play than average children.

The gifted group engaged more frequently in, and spent more time upon, and preferred to a greater extent than the control group activities involving reading.

The gifted children tended to avoid certain types of vigorous physical play. However, the gifted group participated more often than the control group in certain active plays and games although on the whole less frequently in the extremely active plays and games.

Although the gifted group devoted much more time than the control group to reading, the number of activities in which both groups took part was the same. Lack of versatility of play interest may not be pointed to as characteristic of the group of gifted children.

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3. Terman, Lewis M.: *Twenty-third Yearbook. Op. cit.*, p. 163f.
4. Terman, Lewis M., and De Voss, James C.: *Twenty-third Yearbook. Op. cit.* Part I, Chapter X.
5. Davis, Helen: Personal and Social Characteristics of Gifted Children. *Twenty-third Yearbook, op. cit.*, p. 134ff.

A NOTE ON THE RIGHT-WRONG EXAMINATION

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Right-wrong examinations may be used by an instructor not only to measure his students, but also to check up on certain elements in his own instruction. This may be done without reference to the work of any other teacher.

The method is quite simple. It will be remembered that a student is usually graded right minus wrong with this type of examination, for *chance* should give him 50 per cent of right answers even though he has no knowledge to come to his aid. Equally true is it that any one question in a plus-minus examination should be answered right by 50 per cent of the class, for if none of the students know the right answer chance alone would give them that percentage of correct responses. There is an exception to this principle when questions are stated with double negatives or suggestions to mislead the unwary student, in which case many wrong answers may be obtained, but should the instructor wish to survey his work by the method here indicated these types of questions may be omitted.

Plus-minus questions then, that are answered wrong by more than 50 per cent of the class are worthy of note. Disregarding a slight chance factor with small classes, they indicate that the students have a mistaken impression of some fact.

A brief statistical scrutiny of the answers to his right-wrong examinations may then tell an instructor something about his teaching; about the comparative difficulty of different parts of the subject-matter; about student interest and sources of information. A high percentage of wrong answers to any question will show that the particular facts involved have not been successfully taught. They will also show him at times that his phrasing of examination questions has been particularly bad and that in some instances the students have been "more sinned against than sinning."

On p. 267 are the questions answered with a high percentage of error, from a quizz given in the regular process of teaching an elementary class in psychology.

It will be noted that all the questions referred to instincts. This in spite of the fact that several other topics were covered in the

Question No.	Answer	Per cent wrong answers	Question
1	+	55	The chief difference between an instinct and a reflex is that the instinct is a delayed response.
2	−	55	Woodworth believes all feelings to be based on the instincts.
3	−	60	Woodworth believes instincts always have survival value.
4	−	60	Sneezing is instinctive.
5	−	75	A habit long practiced finally becomes instinctive.
6	−	85	An instinct works unconsciously.

examination. The class should undoubtedly review this whole topic. Incidentally these answers show the difficulty of teaching the instincts and at the same time explaining to undergraduate students some of the different view points concerning the phenomenon involved. Questions 2 and 3 show the special difficulty of "authority" questions under such conditions.

Question No. 1 should be intelligible to any one reading the text used by this class, but with No. 4 it shows that the distinction between reflexes and instincts is not clear. Questions No. 3 and, especially, 5 are interesting because they show the interference of popular ideas. According to journalistic literature, things that can be done very quickly and deftly are instinctive. Here a reflection of this usage of the term is shown, indicating that special emphasis should be given to separating out popular from scientific connotations of the word. This is an emphasis that could well be made with all classes. No. 6 is an example of a poorly worded question.

A review of the answers to his own quizzes is often a helpful thing for an instructor to do. He thus can partially measure his own instruction, and correct some of his own faults.

NOTES ON ARTICLES IN EDUCATIONAL PSYCHOLOGY IN CURRENT ISSUES OF OTHER MAGAZINES

REPORTED BY C. O. MATHEWS
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Mental Measurement

Some Results of Intelligence Tests and Achievement Tests in English Given to Entering Normal School Students. Lawrence A. Averill and Alfred D. Mueller. Educational Administration and Supervision, Jan., 1927, 20–25. The Otis Advanced Intelligence Examination, the Cross English Test and the Inglis English Vocabulary Test were given to 114 entering students. The interrelationships between the various tests and scholarship are reported.

Coaching for Mental Tests. Curtis Merriman. Educational Administration and Supervision, Jan., 1927, 59–64. Coaching 50 college students on the Thorndike Psychological Examination produced significant differences in the average scores and produced an advance in placement (one or more quartiles) in the case of 21 out of the 50 students.

Educational Measurement

A Project Test of Achievement in Sewing. F. P. O'Brien and Catherine T. Giblette. The School Review, Mar., 1927, 217–221. Sewing ability is measured by combined judgments of twelve simple projects for hand and machine work.

Baltimore Reading Readiness Test. Frances M. Berry. Childhood Education, Jan., 1927, 222–223. The construction of the test is described and data is given showing the relationship between parts of the test and intelligence and vocabulary knowledge.

Test Construction in Less Standardized Subjects Illustrated by the Richards Biology Test. Oscar W. Richards. School Science and Mathematics, Jan., 1927, 22–27. The author indicates the methods employed in constructing this test, gives its reliability, samples of questions used and a discussion on the value of norms in biology.

A Study of the Reliability of an Objective Examination in Ninth Grade English. Edith L. Hammond. The School Review, Jan., 1927, 45–51. This study shows the reliabilities which are obtained from the use of new type tests constructed by a teacher with no previous experience in making such tests.

A Comparison of Some Tests Given in High School Physics. Vergil C. Lohr. School Science and Mathematics, Jan., 1927, 74–85. The relative merits of completion, true-false and multiple choice tests of "identical" items is reported, and the relation between scores on various tests and success in physics determined.

Technique in the Construction of a Teacher's Own Objective Tests. H. W. James. Peabody Journal of Education, Jan., 1927, 240–243. The author sets forth nine

general considerations and specific directions for the construction of objective examinations.

The Best-Answer Exercise as a Teaching Device. Douglas Waples. Journal of Educational Research, Jan., 1927, 10–21. The author illustrates at length the construction of best-answer exercises in the principal high school subjects.

The Use of the Stanford Achievement Test to Indicate High School Success. Nellie P. Haddock. School and Society, Jan. 22, 1927, 114–116. On the whole students who had the higher educational quotients on the basis of Stanford Achievement scores obtained while in the eighth grade proved more successful in freshman high school courses.

Achievement of High School Honor Students in the University of Missouri. William H. Ziegel, Jr. School and Society, Jan. 15, 1927, 82–84. The group of 200 honor students excelled the control group of "regular students in scholastic attainments as measured by teacher's marks, by excess credit, by university scholarships and by memberships in honorary fraternities."

The Variability of Word-difficulty in Five American History Texts. F. D. Kebach. Journal of Educational Research, Jan., 1927, 22–26. Five texts are compared in regard to the relative number of words they contained above the first 5000 for importance in the *Thorndike Word Book.*

The College Freshman's Range of Information in the Social Sciences. M. J. Van Wagenen. The School Review, Jan., 1927, 32–44. Achievement tests in American history and geography were given to eight hundred students. In history the average attainment of men was about equal to the eighth grade norm which was one year in advance of the women. In geography both sexes are approximately one year lower.

Psychology of Learning

Influence of Primacy. Edward L. Thorndike. Journal of Experimental Psychology, Feb., 1927, 18–29. The results of six carefully controlled experiments show that primacy in a series in and of itself gave no advantage to memory.

The Relation of Retention to the Distribution of Relearning. Loh-Seng Tsai. Journal of Experimental Psychology, Feb., 1927, 30–39. The retention of words resembling advertising materials is shown to exhibit the characteristics of negative acceleration and relearning is shown to be most effective when adapted to that type of curve.

The Development of Sentence Structure in Childhood. William Boyd. The British Journal of Psychology, Jan., 1927, 181–191. This is a detailed analysis of a little girl's sentences spoken between the ages of two and seven.

Psychology of School Subjects

Summary of Reading Investigations (July 1, 1925, to June 30, 1926). I. William S. Gray. The Elementary School Journal, Feb., 1927, 456–466. This is the first part of an annotated bibliography of reading investigations bringing up to date the author's previous summaries.

Training and Experience That Prepare for Reading. William S. Gray. Childhood Education, Jan., 1927, 210–221. Six prerequisites to rapid progress in learning to read are enumerated and discussed.

Investigation of Reading Readiness of First Grade Entrants. Margaret C. Holmes. Childhood Education, Jan., 1927, 215–221. A questionnaire study of the readiness for reading instruction of first grade children is reported. Results are from 560 teachers in 41 states.

Are Children Reading? Stella Yowell. Journal of Educational Research, Jan., 1927, 1–4. The degree to which children are familiar with the leading character of juvenile books forms a basis for conclusions as to the extent of children's reading.

Remedial Reading. Bess L. Crofoot. School and Society, Feb. 12, 1927, 205–206. This is the report of an experiment in remedial reading with adult teachers as subjects.

Comparative Study of the Results in Silent Reading in the Seventh and Eighth Grades in Elementary and Intermediate Schools of Detroit. J. Alexander Kennedy and Emmet Corrigan. The Elementary School Journal, Feb., 1927, 444–446. Although less time is devoted to reading in schools with the junior high school type of organization the amount of growth in this subject is approximately the same as in the traditional elementary schools.

An Experiment Made by a History Teacher. George R. Moon. The School Review, March, 1927, 208–216. The test scores of pupils who read extensively in history surpassed those of the control group who intensively studied the text and limited number of supplementary references.

Is the Kindergarten Child's Vocabulary Larger in Directed or Undirected Lessons? Madeline Darrough Horn. Childhood Education, Jan., 1927, 230-231. The results of this study seem to show that increase in vocabulary is about as rapid in undirected lessons as in the ones directed by the teacher.

An Inventory of English Constructions with Measures of Their Importance. Edward L. Thorndike and others. Teachers College Record, Feb., 1927, 580–610. The inventory as reported includes 438 kinds of constructions with measures of their frequency and range of use. The sources from which obtained, methods employed and reliability are reported.

Economy in the Teaching of High School Literature. Theo. W. H. Irion. The English Journal, Feb., 1927, 114–119. Recommendations are given which are based on an experimental study of the comprehension of literature by ninth grade pupils.

The Interest Factor as Related to Methods of Introducing Beginners to Write. O. E. Hertzberg. Journal of Educational Research, Jan., 1927, 27–33. Greater ultimate interest was developed by the direct-learning method than by the use of mechanical devices.

Certain Arithmetic Abilities of Second Grade Pupils. L. J. Brueckner. The Elementary School Journal, Feb., 1927, 433–443. Measures of ability given previous to and following the summer vacation showed that this vacation had practically no effect upon retention of these pupils' knowledge in arithmetic.

Interest of Pupils in High School Mathematics and Factors in Securing It. Alfred Davis. Mathematics Teacher, Jan., 1927, 26–36. A summary of several questionnaire studies is given with suggestions for increasing the appeal of mathematics to pupils.

Exceptional Children

The Effect of Homogeneous Grouping upon the Quality of Work of Superior Children. M. J. Van Wagenen. Journal of Educational Method, Feb., 1927, 240–247. No very significant differences in achievements are reported between superior pupils trained in segregated classes and those trained in unsegregated classes.

The Gifted Child. Dortha Williams Jensen. Journal of Educational Research, Jan., 1927, 34–45. The educational concepts and practices affecting gifted children are surveyed.

Character and Personality

A Test for Fair-mindedness. Goodwin B. Watson. Industrial Psychology, Feb., 1927, 84–92. The author gives a description of the methods by which a test for fair-mindedness was constructed with suggestions for their application in various fields of human activity.

A Comparison of Raters. Arthur W. Kornhauser. Journal of Personnel Research, Jan., 1927, 338–344. This is a study of the rating tendencies of college instructors by the use of the graphic rating scale on two college groups.

A Comparison of Rating on Different Traits. Arthur W. Kornhauser. The Journal of Personnel Research, Mar., 1927, 440–446. The study includes averages, deviations and relationships among the seven traits rated as well as correlations with scholastic grades.

What Does Honesty Mean to Third and Fourth Grade Children? Frances R. Dearborn. The Journal of Educational Method, Jan., 1926, 205–212. This is a survey of children's ideas of the meaning of honesty including lying, stealing, cheating and withholding of confession.

A Citizenship Rating Scale. Edward L. Hill. Education, Feb., 1927, 362–371. The rating scale covers seven items with sub-heads and definitions.

Measuring Student Opinion of Teachers. E. R. Guthrie. School and Society, Feb. 5, 1927, 175–176. The reliability of student opinion of teaching based upon opinions of over 800 pupils is reported.

Educational and Vocational Guidance

The College Studies Its Students. Dorothy W. Holbrook. Industrial Psychology, Jan., 1927, 41–48. Methods employed at Northwestern University in the study of college students who were on probation are reported. Copies of a useful record blank and rating scale are included.

The Problem of Adjustment of University Students. Ellen B. Sullivan. The Journal of Delinquency, Sept., 1926, 461–462. This is a brief account of the methods used to aid the adjustment of a Russian student. The detailed autobiography (covering 36 pages) written by this student for the examiner and advisor immediately follows this account.

The Permanence of Vocational Interests of Junior High School Pupils. E. Earle Franklin. The Vocational Guidance Magazine, Jan., 1927, 152–156. Results of this study show a high degree of permanency and on the average pupils who choose professional occupations rank highest on mental tests.

School Marks

School Marks vs. Intelligence Rating. David Ohlson. Educational Administration and Supervision, Feb., 1927, 90–102. The school marks and Terman test scores for 506 senior high school pupils furnish data for studies of the relationship between these two measures and between scholarship and sex.

A Study of the Significance of College Marks Considered as Ranks. Edward B. Mersereau. Educational Administration and Supervision, Feb., 1927, 103–108. It is demonstrated that there is considerable overlapping in college marks on an A, B, C, D, F basis when they are transmuted into comparable *value* scores.

Miscellaneous

A Mechanical Ability Test. T. W. MacQuarrie. Journal of Personnel Research, Jan., 1927, 329–337. A paper and pencil test of mechanical ability is described and data furnished which show the reliability and validity of the test.

The Present Status of the Tendency to Collect and Hoard. Harvey C. Lehman and Paul A. Witty. Psychological Review, Jan., 1927, 48–56. Only a small per cent of the children studied were engaged in making collections. These results are contrasted with earlier studies.

On Computing the Average Deviation from the Mean. Herbert A. Toops. Journal of Educational Research, Jan., 1927, 46–51. A simple method of computing the mean and average deviation is explained together with an illustration of a printed form sheet.

To What Extent May We Rely upon the Answers to a School Questionnaire? Andrew T. Wylie. The Journal of Educational Method, Feb., 1927, 252–257. An objective check on 13 items of a questionnaire showed that children's responses were from 60 to 100 per cent correct.

Tools of Research Needed in the Preparation of Dissertations for the Doctorate in Education. James C. Bay. School and Society, Jan. 8, 1927, 53–54. An examination of 211 volumes of the Teachers College Contributions to Education shows that in 1910 foreign language and statistics were about equally needed tools while in 1922 statistical methods were used in about 78 per cent of the dissertations and foreign languages in about 15 per cent.

Family Background and College Success. E. L. Clark. School and Society, Feb. 19, 1927, 237–238. It is shown that parents' place of birth, education of parents and education of brothers and sisters have very little or no relationship to scholastic achievement in college.

NEW PUBLICATIONS IN EDUCATIONAL PSYCHOLOGY AND RELATED FIELDS OF EDUCATION

CONDUCTED BY JOHN HOCKETT
The Lincoln School of Teachers College

A Cross Section of Present Psychological Theory

Psychologies of 1925, being the Powell Lectures in Psychological Theory. Clark University, Worcester, Mass., 1926. Pp. 412. $6.00.

The lectures comprising this book were made possible by a gift from Dr. Elmer E. Powell who, conscious of the "futility resulting from unadmitted fundamental differences in theoretical presuppositions" desired that there should be presented by the various true leaders, "a genuine cross section of contemporary theoretical psychology." This object has been in large measure achieved, by the expositions of the leaders of the different schools—expositions which, while revealing no startling developments, certainly cannot be regarded as "rehashes" but are rather, in general, carefully thought-out statements of the several positions maintained.

The behaviorists are given first place. (Is the order alphabetically determined?) This school is much more sharply divided from others, not necessarily in its experimental methods, but in its theoretical presuppositions—though it claims to make none of the latter. In fact the division is so sharp that the meaning of the term psychology must be widened out of all proportion in order to include the school. The behaviorists, conscious (if they can be) of this fact, have contrasted themselves with psychologists, indicated a desire not to be classed as such, and even gone the extreme length of perpetrating the term "anthroponomist" by which to be designated.

In order to understand the nature of anthroponomy, one should neglect the first three papers, and read that of Hunter. He, in a paper that is free from the usual scornful invective, exposes the true difference between psychology and anthroponomy. His arguments do not appear as clear as they might be, but this is possibly due to the interference effect of much Wundtian conditioning However, one comes

before the end to see quite clearly that the anthroponomist regards man as being in the same universe (using the word in a technical sense) as the remainder of the environment. (In the penultimate generalization he must be). This is to say that man is regarded as one of the objects of the environment. He is not distinguished from it as a special kind of being with a mind, but is studied as some entity interacting in a mutual manner. To regard him so is not new (though it hurts his conceit), but to study him as such is certainly a novel endeavor. One cannot but regard it as essentially scientific, much more in line with the tendencies of the age, with other sciences, such as biochemistry, and really in conformity with modern philosophic tendencies. It cannot by any logical person be regarded as more mechanistic than psychology, ethics, or even religion. Its most appealing feature is the avoidance of the old mind-body problem, which so sorely troubles all psychologists.

One finds however that the flesh, even of an anthroponomist is weak and that in whatever manner come by, the universal tendency of academicians to theorize has prevented Watson and Hunter from maintaining their original position. From a detached study of man, without presuppositions (or were they inherent from the beginning?), they have come to state the hypothesis that man has no mind or consciousness. This statement unprovable by any means, is therefore a matter of belief, not a scientific theory.

Hunter (p. 100) exposes one fundamental limitation in all psychology in saying that the psychologist "fails to harmonize his problem to be investigated with the methods to be employed." For not by any manner or means, introspectional or otherwise, can my experience be truly investigated. I may behave as if I did have such or such experience, but that I did, even if I say so, is beyond the capacity of any man to know. The behaviorist must take care lest he fall into a like error, and assume that he can prove that I did not.

The first three papers, by Watson, are mainly descriptive of experimental work undertaken, and indicate the nature of the problems attacked. Watson's generalizations do not, in general, follow from the experimental results, and appear unnecessarily inaccurate and provocative.

The psychologists all believe in the existence of a mind or consciousness. Knight Dunlap is refreshingly candid in exposing the logical difficulties of his situation (others do not openly mention their difficulty). He says, "If I am asked by an acute philosopher: 'How can

you assume the occurrence of consciousness, if you do not assume that consciousness is observable?' I have to reply: 'Well, why not?'" (p. 327). One may in fact profitably turn from the consideration of the early papers to those of Parts V and VI. For here one finds statements of the so-called traditional psychology (in Chaps. XIV and XVII–XIX), some account of its historical development and the influences which are modifying it. Assuming the existence of a mind or consciousness, and experimenting with a degree of refinement approximating that achieved by the physicist, they proceed to say that their experiments show that the mind is so constituted and functions in such and such manner. While it would be an unnecessary burden always to insert the proviso, "*If man has a consciousness*, then our experiment, (*i.e.* his behavior) shows that it must be fashioned so," its constant omission constitutes a serious unadmitted presupposition. The major portion of their psychology, occupied with considerations as to the nature of the mind, almost solely limited to cognition (sensation, perception, and the like) while interesting as an exercise in "autonomous thinking" is really little more than speculation, perhaps æsthetically appreciable, and valuable for this purpose. Its main function seems to be limited to suggesting possibilities, and thus stimulating experimental investigation.

Having considered the positions assumed by "orthodox" psychologists and anthroponomists, one may turn to those whose positions are not so sharply separated from either.

Woodworth stands alone as an advocate of dynamic psychology. His stress is on the fact that man is an ever-changing entity in an ever-changing environment. All is in a state of flux. It is the hard task of the psychologist to relate these movements, in an endeavor to trace their influences one on another, and if possible discover tendencies and laws which may enable him ultimately to control. Woodworth's notion of the dynamic individual in a dynamic universe, avoids on the one hand the anthroponomist's man who, a mere puppet of Fate, reacts only to a changing environment and, on the other, that of the purposivist who, man of Destiny, goes through the world seeing, interpreting and using the environment just as he pleases. To some extent it embraces the difficulties of both schools of thought.

The Gestaltists in their theories are akin to the psychologists, but in their experimental work and observations are more like the anthroponomists. Their view is that man reacts to a situation as a whole which, to an extent determined by intrinsic factors, has a certain

configuration, form or meaning for him, and that the totality of elements (which he does not see as such) constitute this "gestalt." Again the theoretical interpretation is of the mind, and the manner in which it apprehends presentations. On this plane, the Gestalt theory is an inadequate explanation, for it can be (in the psychologist's sense) experimentally shown that the elements are first apprehended and then built up to a whole, of which the relationship to the parts is one of constitution. The laws of this constitutive process are more fundamental than the product. The studies of the behavior of men and animals (which do not necessitate the formation of such theories) are of very considerable importance. Insofar as they have been motivated by the Gestalt theory, it has been valuable.

Of the purposivists (both of whom are too largely concerned with misunderstanding behaviorism), Morton Prince discusses mainly the mind in its various manifestations, awareness, consciousness, co-consciousness, and the like. His studies in the behavior of abnormals has led him to enunciate theories as to the mechanical construction of a purposive individual. His whole conception of personality as something which may by internal conflicts between its various animistic parts, disrupt and dissociate, is apart from its own inconsistencies, much too fantastic to be acceptable, as an explanation of the conduct of mere ordinary mortals. One cannot see either the place of purpose in all this dissension.

McDougall views men as individuals with purposes (whence derived?) set in an environment where abound obstacles and accidents, which but stimulate him to achievement This view appeals tremendously; man is seen, not as a piece of earth to be moulded thus or so, not as a ghostly imaginer of pin pricks and strange shapes, not as a dynamic particle obeying the laws of Boyle and Charles, but rather as an Alexander, or a Mussolini, having God-like attributes. Perhaps man is thus the Master of his Fate. To McDougall it is obvious, but that is not sufficient. Unfortunately he does not, and cannot prove it, but merely attempts to describe a very desirable possibility. This otherwise appealing theory (involving at all points the mind-body problem) appears to have a place rather among beliefs and religions, than among scientific hypotheses.

Here then in this book, one has an opportunity of discovering the basic similarities and differences between psychologies, in a manner not before possible. For while it has always been possible, by wide reading to gain some idea of the essentials of each school, this has necessitated

much cross-reference, much analysis, much disregard of inconsistencies within each, and very considerable difficulty in interpreting meanings and connotations. It must not be assumed from this latter statement that the casual reading of these lectures will provide an "Open Sesame" to the understanding of all psychologies (and anthroponomy), for in some measure the difficulties remain—as possibly they always must. The thoughtful study of the lectures, however, must lead the intelligent reader to an orientation which makes possible a logically determined position for himself.

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AN EMPIRICAL STUDY OF CHILD LOGIC

The Language and Thought of the Child, by Jean Piaget. New York: Harcourt, Brace and Co., 1926. Pp. XXIII + 246. Translated from the French by Marjorie Warden.

This is the first of two Studies in Child Logic by M. Piaget to appear in the International Library of Psychology. The second (not yet translated), entitled *Judgment and Reason in the Child*, grows out of the first integrating and drawing conclusions from the evidence here presented.

The present volume deals less with theoretical problems than do many included in this series, being in the words of its author "simply a study of the facts of the case." These facts consist in the minute record of the spontaneous talk of two six and one-half year old children in the free environment of the *Maison des Petits de l'Institut Rousseau* during the period of a month, similar but less extensive studies of the speech of twenty children four to seven years old, the record of 1125 questions asked by a child between six and seven over a period of ten months, and some controlled experiments on the lack of understanding discovered to exist between children.

As direct in his analysis of his data as in his method of collecting it, M. Piaget attempts not to run children's speech into the molds of adult logic but to classify it in an attempt to discover "What are the needs which a child tends to satisfy when he talks?" The dichotomy between ego-centric and socalized speech underlying all children's thinking, the early predominance of "syncretism" (unanalytic and subjective thinking), and the lack of perception of sequential relations up to seven years are the chief con-

clusions which emerge. This observational method and functional analysis will, of course, meet with the usual objections accorded to any descriptive study: insufficient data and subjective interpretation. But, even granting these difficulties as the author himself would be the first to do, the value of his approach lies not only in the fresh insight afforded into the child's speech from the child's own point of view but in making possible controlled experimentation on more significant data than would have been possible without the preliminary descriptive studies.

The controlled experiments themselves are open to criticism as dealing with too complex material which the children would not spontaneously attempt to understand or to explain to each other, and as not being, therefore, an adequate test of the degree of their understanding. But although M. Piaget may underestimate the extent of children's explicit understanding of each other and of adults before the age of seven, this does not lessen the importance of his conclusion that there can be no adequate interpretation of children's verbalizations without a patient unravelling of the genesis of these thought patterns.

Not the least value of a study of this sort, breaking ground in a relatively new field, is the impetus it gives for further exploration. Many questions become more important in the light of M. Piaget's work: Under what conditions does a child make the most effective transition from an undue proportion of autistic thinking to more socialized thinking; how does a child's attitude toward reality, as revealed in his verbalizations, affect his personality; how does a child become adapted to the over-lapping and often conflicting institutional worlds in which he finds himself; by what steps is the transition made from early attitude of unquestioning acceptance to a questioning, agnostic attitude with a regard for sequential relations; what is the significance of the functions of children's thinking for adult logic? To a more adequate answer of some of these questions this volume points the way.

HELEN MERRELL LYND.

SELECTIONS FROM THE LITERATURE OF ABNORMAL BEHAVIOR

Readings in Abnormal Psychology and Mental Hygiene, by W. S. Taylor. New York: D. Appleton and Co., 1926. Pp. XXXIII + 789. $4.00.

The literature of abnormal psychology and of mental hygiene, appearing in both books and periodicals, has become so voluminous

during recent years that it cannot be covered in thorough fashion, except by a scholar devoted to that task alone. Yet it is important for all who are students of human problems to sift this literature—"for all," because the information thus to be derived is basic to enlightened dealing with persons, and "to sift," because public interest has led to the printing of much that has no warrant in verifiable fact or principle. Therefore, those who ought to know of the contributions in this field, but who cannot devote themselves to it, need from time to time compilations by discriminating scholars.

This book is a compilation of abstracts from what has been written about the causes and the prevention of mental disorder. Dr. Taylor, Professor of Psychology in Smith College, has reviewed the literature thoroughly, and has culled in comprehensive manner from all points of view. Psychologists, psychiatrists, social workers, pastors, educators have been consulted. The contributions quoted come from many different countries, America, England, Germany, France, Italy, Austria, Switzerland and Scotland. The selection of excerpts is well-balanced. The most bizarre conceptions of mental ills, those not related to established principles of normal psychology, have been avoided, and no one school of thought dominates the presentation. The book is free from cultism. The twenty-six chapters cover definition of the field, nomenclature, causes, history, basic psychological conceptions, dissociation, meaning, conflict, regression, dreams, problems of personality and psychotherapy.

Author and publisher offer the volume as a text; but a source book can rarely succeed as a text, because treatment of a subject by means of a compilation of direct quotations is bound to be topical, whereas teachers generally prefer a systematic text. As is suggested by Dr. Jastrow in his introduction to the book, it will probably be used widely as collateral reading for students. It will, no doubt, find its way to the desks of those who give lectures, more often than to the desks of those who take lectures.

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Exhortations and Hints for Students

Learning How to Study and Work Effectively—A Contribution to the Psychology Efficiency, by W. F. Book. Boston: Ginn and Company, 1926. Pp. XVIII + 485. $2.80.

Self-direction and Adjustment, by Norman Fenton. Yonkers, New York, World Book Company, 1926. Pp. VI + 121. $1.40.

How to Study in College, by L. A. Headley. New York: Henry Holt and Company, 1926. Pp. X + 417. $3.00.

There comes to the reviewer's desk three books on how to study, all published in the same year. These and a fourth book by Crawford, which is not at hand, testifiy to the remarkable interest that has developed in this problem of effective study within recent years.

The three books mentioned above are in many ways alike. Although differing in organization and emphasis they cover approximately the same topics. All of these books devote space to such matters as keeping fit physically, mental hygiene, avoidance of fatigue, concentration, when and where to study, the use of a schedule and working according to plan, preparing for an examination. All of the books discuss such topics as will power, remembering, and reasoning to an extent that smacks of faculty psychology. All of the books are written in the hortatory mood—a direct appeal from the writer to the reader. In Headley's book the center headings, with which the volume is copiously supplied, are exhortations. I pick at random: "Work memory materials into systems," "Determine basis of comparison," "Isolate elements to be judged," "Have a standard of reference." All of the books seem to be glorified expansions of the famous chapter in James' Psychology on "Habit."

Each of the books has its individuality Book's volume comes nearest to being a textbook in form. It has been carefully paragraphed by the publisher. There are suggested experiments sprinkled through and at the end of each chapter are sets of exercises and questions and a reference list. Book approaches his task from the point of view of the descriptive psychologist, who is particularly versed in the psychology of learning Frequent references are made to psychological experimentation to justify a position. There are also many anecdotes which serve to vivify a point and bring it home. Book gives special attention to ideals and the will as a condition for effective study. He also devotes many pages to the matter of budgeting time and carrying through the time schedule according to plan.

Headley's book is more of a narrative. It is written interestingly and ought to appeal to college students. Headley draws his illustrations from college life, yet shows that he has made reference to a wide range of psychological and pedagogical material in planning his book. Exercises are given at the end of chapters. Headley has the needs of the college student definitely in mind. Particular emphasis has been given to the mental processes involved in remembering, judging, and reasoning.

Fenton has addressed his book to the high school student and the teacher as well as to the college student. The treatment is much more brief than that of the others and tends in places to be sketchy. Part of the brevity may be accounted for by the omission of anecdotes and concrete illustrations. This writer shows a familiarity with the measuring movement and incorporates in his book the reading tests of the Stanford Achievement Test and one of the Otis Intelligence Tests. There are no exercises at the end of chapters.

It is evident that books in this field are in demand for college classes in the art of study. There is a widespread movement to incorporate in the freshman year an orientation course, part or all of which is devoted to the technique of study. There is no doubt that this movement is to a degree worth while. But in a more critical mood two questions may be raised. One is: Does anyone know the conditions and techniques of effective study? For instance, one may admit the value of the advice of keeping fit physically so far as it concerns personal hygiene in general or mental hygiene in particular. Such advice ought by all means to be included in a discussion of the larger problems of personal adjustment. But the value of this emphasis on physical fitness as a condition of effective study may be disputed. Many of the superstitions regarding the relation of ventilation to mental work were only dispelled by experimentation. Quite possibly the emphasis of these books may be a very distorted one and some factors of little influence on the effectiveness of study may have been given much emphasis while other topics of much importance have been relatively neglected.

The second doubt raised in the mind of the reviewer is the value of the exhortation as a means of increasing study effectiveness. What is needed is technique rather than will-power. What is oftentimes regarded as laziness is really not knowing how. Probably more could be done in raising the effectiveness of study by shifting the emphasis from "start with vigorous initiative" to making sure that the student

knows what he is to do during the first five minutes. In one way these study manuals are unique—they are probably the only manuals that are filled with exhortations and advice which goes all around the topic. A cook book, for instance, is filled with recipes; not with exhortations to have all ingredients at hand when commencing to cook, to be sure that knives are sharp and to keep one's attention on the stewing so that it does not stew over. Dr. Butterweck in a controlled experiment demonstrated that only the brightest pupils can profit by descriptions and exhortations on how to study, and that most pupils in high school profit most by actual drill in the techniques of favorable study. Particularly flagrant in this connection seem to be the chapters on "How to Reason." No thinker in any field, whether it be mathematics, economics, or psychology, sits down when confronted with a problem and says "Now according to the rules on how to reason what do I do first?" One is either thinking about his subject or about how to reason; but it takes particular skill and ability to do both at once and make the latter contribute to the former.

This movement toward increasing the efficiency of the student will expand. It is to be hoped that future manuals will give less attention to vague exhortation and generalizations and will give help in specific modes of work in various fields.

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VOCATIONAL GUIDANCE IN THE COLLEGES

The Vocational Guidance of College Students, by Lewis A. Maverick. Cambridge, Mass.: Harvard University Press, 1926. Pp. VI + 251. $2.50.

This book reports the results of several surveys regarding the status of vocational guidance in colleges: one conducted by the faculty of Stanford University 1911–1913; one by Harvard University and the United States Bureau of Education in 1920; and a third consisting of visits made by the writer to 22 institutions in 12 states in 1924–1925.

The findings of the first mentioned investigation show that such guidance as was given was carried on chiefly through faculty advisers, but it was largely uncoordinated and non-systematic. On the basis of it the committee on "individual training and vocational guidance" presented its findings to the Academic Council of Stanford. As a result of its recommendations the Senate of the University established a standing committee on vocational guidance.

Meantime interest in vocational guidance has been increasing throughout the country as is shown by the results of the survey made in 1920. The author summarizes the replies given to the 1920 questionnaire by 225 institutions. The author names these institutions and gives a brief statement indicating the character of the guidance given. In 18 per cent of the cases appears the laconic "no"; in 9 per cent the guidance is characterized as "informal," which probably means on guidance of a systematic kind. In most of the other cases the forms in which guidance was given are quite evidently of a rudimentary sort.

A fourth of the book contains descriptive reports of guidance services rendered by 22 selected institutions which the author visited in 1924–25, and by a miscellaneous list of bodies such as the American Association of University Professors, American Association of University Women, Associations of College Officers. One wonders at the inclusion of some of these organizations whose connection with vocational guidance is exceedingly remote.

The final chapter entitled, "Plans for Vocational Guidance of College Students," contains discussions of various plans in the light of their advantages and disadvantages.

An annotated bibliography of 66 pages is added.

It is to be regretted that the author did not make any quantitative use of his results; that he did not, for example, list the common functions of vocational guidance such as "Giving Information about Vocations," "Placement," etc., and make a thorough count of the number of institutions that are performing each function. It is to be hoped, however, that the qualitative descriptions of guidance which are given in the book will stimulate college administrators to provide more adequate facilities for the performance of the important functions of guidance.

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A New Text Stressing Adjustment

Psychology: Its Methods and Principles, by Perrin, Fleming A. C., and Klein, David B. New York: Henry Holt and Co., 1926. Pp. X + 387.

A new text may reasonably be appraised on the basis of the following considerations: its usefulness as a tool of instruction; its contributions in point of view, organization, and content to already existing

stocks; its qualities of style, and the scientific validity of the principles it advocates. Rated on these points, Perrin and Klein's *Psychology* would rank high.

Believing that psychological materials can be most effectively organized for the college sophomore about the concept of adjustment, the authors have adopted a behavioristic program with its inevitable stimulus-response shibboleth. They treat stimulus and response in terms of cause and effect, stressing the fundamental similarity in the mechanism of the two and attributing to sequential order or the viewpoint of the observer the determination of what is stimulus and what is response. It seems, then, somewhat inconsistent after such an exegesis that muscles should be labelled the organs of response.

The authors, responding, too, to the observation that students fail more significantly in the detection of similarities between psychological phenomena than in the discrimination of differences, have striven to link subsequent presentations with preceding in such a way as to throw into relief essential likenesses. As a result a coherence has been attained in their material that is almost unique among the brief surveys of scientific fields. The chapter headings are as follows: The Problems and Methods of Psychology, The Biological Foundations of Behavior, The Psychological Foundations of Behavior, the Motivation of Behavior, Learning Behavior, and Intelligent Behavior. The caption of the last chapter is perhaps the least effective for, since the position is maintained that all intelligent behavior is adaptive behavior, the differentia of the materials presented in the division are scarcely accurately indicated. The section, including as it does discussions of mental development, language acquisition, thinking, intelligence, mental measurement, mental organization, and personality, touches with effect many practical problems as well as a few of the fundamental theoretical problems of psychology which in general, it seems to be the authors' intent to tap very lightly. It is in this last chapter that the question of the nature of mental activity is first mentioned, mental activity being defined as substitute or symbolic responses.

The style of the text is both limpid and lucid. Illustrative gleanings from university life abound. Still, one could not describe the work as elementary or popular. The authors draw as far as possible from very modern sources of experimental data, and in the chapter on Learning Behavior, for instance, choose to accent the questions of the nature of learning and of the methods of analysis in animal learning rather than the more practical consideration of the many factors which

condition the speed of learning. The compactness and general suggestiveness of the content, together with the rather extensive bibliographies of recent contributions to the general subject-matter of the various chapers, offer the opportunity for a classroom expansion of the materials of no small scope, if the instructor so desires.

So full is the text of reports from the literature of experimental psychology that it occasionally assumes the character of a collection of readings. Usually the reports or excerpts are skillfully arranged into a harmonious mosaic. In the chapter on Learning Behavior, for instance, is to be found one of the most highly effective, well-synthesized, critical presentations of the theories of learning as yet published.

Such problems as those of consciousness, awareness, self, mind-body, and even heredity receive, in keeping with the expressed intent of the authors, a very staccato treatment. *Per contra,* more than the usually allotted space is given to a consideration of the concepts of vicarious functioning of nervous tissue, localization of function, inhibition, mental organization, the nature of learning, emotion, and the conditioned reflex. One is left with the impression that in their analyses the authors have succeeded to a greater extent than in their syntheses, though their accomplishment in both phases is truly significant. Their product is not only a good text but also a real contribution to the literature of psychology.

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INTELLIGENCE TESTING A LA SPEARMAN

A New Method of Mental Testing, by J. J. Strasheim. Baltimore: Warwick and York, 1926. Pp. X + 148.

This little book is an attempt on the part of a disciple of Spearman to give us "that new and more rational method in evaluating and constructing tests which is indispensable." Indispensable because the writer of the book thinks the mental testing movement has reached an impasse and is convinced that unless we follow his suggestions the testing movement will have the faith of Humpty-Dumpty. This sad state of affairs he thinks, is explainable by the fact that the framers of the tests do not know what it is they are testing. They have no clear conception of intelligence. Consequently, have no valid criteria for evaluating test materials.

His solution? Accept Spearman's definition described in "The Nature of Intelligence and the Principles of Cognition" and "all the

practical implications of this definition, by showing how tests should be constructed, or be chosen, solely from the point of view of this definition."

Of the ultimate principles to which Spearman reduced all cognitive events, the writer selects the three qualitative principles as being the only ones that "comprise any operations which may properly be termed 'intelligent.'" The three principles are:

1. Any lived experience tends to evoke immediately a knowing of its characters and experiences.

2. The mentally presenting of any two or more characters (simple or complex) tends to evoke immediately a knowing of relation between them.

3. The presenting of any character together with any relation tends to evoke immediately a knowing of the correlative character.

The first principle we are told forms an essential basis for all cognition. Intelligence refers to mental operations described in the last two principles. All differences in intelligence can therefore be measured in terms of the process of eduction. Brighter children can educe relations and correlate more effectively and in less time.

So much for theory and point of view. The larger part of the book contains descriptions of the tests used in investigating children of preschool age. In two of the tests the required relation is supplied in the initial situation. This is followed by more and more complex situations—situations calling for more difficult eductive operations. These tests are purposed to throw light on the problem of intelligent learning. To discover the difference the introduction of a relation makes in an apparently habitual operation a cancellation test was used. The description of the tests and technique used is worth reading.

On the basis of this investigation the writer makes all kinds of educational suggestions. For example, he restates Herbart's "Steps" in terms of eduction of relations. How significant is this study? Spearman in the preface says the harvest is a rich one. In the opinion of the reviewer, few American psychologists would agree with him. Fundaments, eductions, principles of cognition—these are interesting logical concepts. But when all is said and done do they really give us a new and more rational method of mental testing? Will these ultimate principles of cognition do more for the improvement of tests than have the criteria used by Binet and his followers or Thorndike and his followers? Science knows no ultimates; logic and metaphysics do

have ultimates. Is not Professor Godfrey Thomson's "sampling theory of ability" more promising because more practical?

Much more can be said concerning the conception of intelligence and methods of testing advocated in this book. But nothing with more safety and justice than this, the last sentence in the book: "Future research alone can show the consequence of its consistent adoption."

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INVESTIGATION IN MUSIC EDUCATION

The Group Method of Measurement of Sight Singing, by Raymond M. Mosher. New York City: Teachers College, Columbia University, 1925.

Probably no subject is in as dire need of investigation as the subject of music education. And curiously enough the need for more edification is not generally felt. "Music is an art," music teachers say, "and it is sacrilegious to apply scientific methods to its problems." Nobody denies that music is an art, but the teaching of music to the children of our land involves more than art knowledge. Pedagogy is a science, but music methodology is merely a tradition. More studies such as Raymond Mosher's will enable us to develop a pedagogy of music by which the speculative and traditional procedure now in use may be replaced.

Mosher took for his major problem the investigation of relationship existing between knowledge and performance. Seven tests were constructed for the measurement of musical achievement (knowledge), and a battery of sight-singing tests for measuring skill in the manipulation of musical notation (performance). The achievement tests were administered as group tests; the sight-singing tests were administered individually. Over 700 children from Grades V to VIII were tested. Three different cities cooperated with the author in making the study. Only 128 unselected cases were given the sight-singing tests and the scores earned by these children correlated with the achievement scores. His attempt to ascertain to what extent group measurements revealed individual sight-singing skill resulted in a positive correlation of .65. Indirect as such a method of procedure may be, it is likely to be more accurate than the subjective judgment of the classroom teacher.

Some minor projects in this investigation are: Relationship between the Seashore measures of musical talent and sight-singing scores; relationship between intelligence and musical achievement; influence of private training on sight-singing; intercorrelations; etc. Mosher's findings substantiate the results of other investigators on these subjects. The Seashore tests do not have prediction values for performance. Mosher found that those of mediocre talent achieve more in terms of their endowment than do those of superior capacities. The aptitude tests measure the amount of talent the child possesses, whereas the achievement tests measure the use to which that talent is put. It must not be presumed that the two bear a fixed and rigid relationship. This antithesis I attribute chiefly to the fact that our courses of study are designed to meet the needs of the mediocre, and consequently the superior in music are neglected.

I recommend this work to all teachers and supervisors of music. They will see that there is nothing inimical in the scientific study of art problems. If we are to improve the teaching of music in our schools we must resort to the use of tests and measurements. We must know more about teaching music. We should know whether an increase in the child's notational knowledge is accompanied by greater proficiency in the use of symbols (sight-singing). We should know the factors that limit and condition the child's growth in music. We should know why the superior are not realizing more on their musical potentialities. We should know more about the reliability of native capacity tests, and if they are deficient, why they are deficient. We must know an inexhaustible number of things before we have a pedagogy of music. Mosher should be commended for his excellent contribution and urged to continue his investigations in the field of music education.

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